

2017 Sustainable Development Report

EXTRACTS FROM THE REFERENCE DOCUMENT



2017 SUSTAINABLE DEVELOPMENT REPORT

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➤ INTRODUCTION

Air Liquide's ambition is to lead its industry, deliver long-term performance and contribute to sustainability.

The United Nations' 2030 Sustainable Development Goals, and in particular climate change, are major issues.

Through its business, Air Liquide has always made a significant contribution to improving the environment and society. The Group is keen to take an active role in protecting the planet and the quality of life of its inhabitants by developing solutions to help the transition to a carbon-free economy and improve air quality.

Listening to and in-depth dialog with various stakeholders and its presence in 80 countries, help Air Liquide better understand local and global usage trends and act, in particular in favor of the environment and local development.

The 2017 Sustainable Development Report summarizes the Group environmental and societal actions. These actions are monitored using key indicators which track their progress. Just like the financial report, this extra-financial report is reviewed each year by an independent verifier. In 2017, 24 industrial sites and subsidiaries were audited.

For further information, the Group's website has a section dedicated to Sustainable Development:

<https://www.airliquide.com/group/ambition-commitments-objectives>

➤ PREREQUISITES TO ACTION: SAFETY, ETHICS AND THE RESPECT OF HUMAN RIGHTS

The General Statement of the Air Liquide Group's Principles of action, which is shared with all entities and is available in the Group section of the website at (<https://www.airliquide.com/group/groups-principles-action>) is as follows:

"Safety is our licence to operate.

The Air Liquide Group adheres to the highest standards in conducting business and is particularly committed to respecting Human and labor Rights and to protecting the environment.

Wherever Air Liquide is present its subsidiaries blend into the local cultures and traditions while transmitting the Group's values through their actions and local engagement. Air Liquide complies with all laws and regulations,

notably on fair competition, and will not accept corruption in any form. Integrity, transparency, constant questioning, improving performance through innovation and rigorous management all shape our behavior and our actions."

The Principles of action explain the Group approach to all its stakeholders.

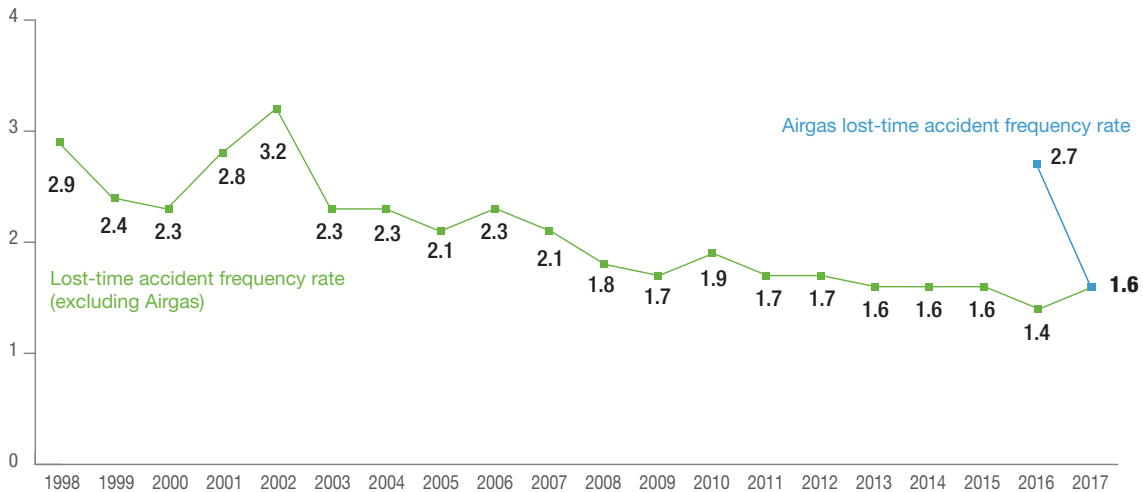
Air Liquide is a signatory of the United Nation's Global Compact and has set standards in terms of ethics and the respect of Human Rights for conducting its business. Moreover, its businesses comply with a regulatory framework in both societal and environmental terms. Complying with these standards is a prerequisite that is independent of Air Liquide's Sustainable Development approach.

1. Safety: Air Liquide's priority

Objective: 0 accidents

Successful integration: Airgas lost-time accident frequency rate in line with the rest of the Air Liquide Group at **1.6**.

FREQUENCY OF ACCIDENTS ^(a)



(a) Number of lost-time accidents with at least one lost-day per million hours worked by Group employees.

The Group's frequency rate is in line with previous years.

No fatal accidents within the Group, at our subcontractors or among temporary workers.

Safety is an integral part of Air Liquide's operational excellence. It is a Group fundamental. Air Liquide, as a responsible industry player, is committed to the efficient and ongoing reduction of its employees, customers, subcontractors and suppliers' exposure to professional and industrial risks. Commitment to safety must be total, visible, accompanied by unshakable vigilance and must allow the achievement of the zero-accident objective.

By respecting and by actively managing safety rules, understanding the risks in all situations, adapting behavior and looking out for others, all Group employees and subcontractors are encouraged to act in a safe manner.

Safety is a joint commitment and the responsibility of each individual. Prevention, protection, early detection and rapid reaction are at the heart of the Group's concerns.

A central team of experts leads networks of specialists on-site to see to the proper implementation of the IMS (Industrial Management System).

Together, they provide local managers in the Group's various entities with technical and methodological support and participate in managing industrial risks.

In 2017, the Group continued its programs in three separate complementary areas which are: employee safety, process safety, and road safety. Group-wide initiatives exist involving both managers and their teams.

"Life-Saving Rules" apply to all production sites. These rules are aimed at Air Liquide employees as well as temporary workers and subcontractors.

Feedback is also an essential practice in the Group's safety approach. Lost-time accidents and potentially serious safety incidents are analyzed using the Fault Tree method. The combination of events that were generated are determined and depicted and their root causes identified so that lessons can be learned and an action plan set up. These elements are then shared to prevent similar events occurring. This approach is a fundamental element in ongoing prevention for safety.



Safety at Airgas

The number of accidents at Airgas has decreased significantly since its acquisition by Air Liquide. This is due to the organization's strong will which provided leadership to all managers in terms of safety. A new safety management program, which is now led by a central team, has enabled the introduction of safety action plans that are in line with Group recommendations and which focus on harmonizing and improving practices:

- for example, an initiative was introduced to identify and manage industrial risks;
- the use of risk analysis and change management was stepped up;
- special attention was paid to road safety.

1.1. Industrial Management System (IMS)

More than 10 years ago, Air Liquide introduced an Industrial Management System (IMS) dedicated to its businesses. It is designed to profoundly transform the way of working and to strengthen the process for managing safety, reliability, environmental protection and industrial risk management. It has been rolled out throughout the Group and its implementation is controlled through IMS internal audits.

An indicator was implemented in order to track the percentage of revenue covered by these audits over the last five years. Between 2013 and

2017, 76 entities were audited, representing nearly 84% of the Group's activity^(a). The integration of Airgas provided an opportunity to assess how to improve management's protocol for Air Liquide's industrial risks by drawing on Airgas' best practices.

Alongside this approach and to meet the requests of certain customers, the Group entities carry out other initiatives such as ISO certifications (see page 114).

1.2. Prevention in the field of health in the workplace

Air Liquide is particularly concerned with ensuring that its employees' working conditions do not present any health risks. This includes preventive measures in various areas.

In many countries, employees are given first aid training and some are certified to use an AED (Automated External Defibrillator).

For example, in Russia, the safety matrix for the electronic activities of TGCM (Total Gas and Chemical Management) has been updated. This easy to use matrix presents the risks of each chemical product as well as the PPE (Personal Protective Equipment) to be used when manipulating these products.

(a) In revenue terms and including Airgas.

In several Group entities, preventative screening was offered to employees:

- dermatological screening to prevent skin conditions;
- breast cancer screening;
- nutritional advice;
- awareness raising of diabetes and screening;
- dental examinations, etc.

1.3 Subcontractors' safety

Working with subcontractors implies that each party understands the role entrusted to it in terms of health and safety. At the subcontractor selection stage, health and safety specifications are included in the call for tender to guarantee the Group's requirements in these areas. Moreover, several departments are involved in the validation of a new subcontractor (Procurement, HSE, Logistics and the local entity).

Communication with subcontractors is very important to ensure that requirements in terms of health and safety in the workplace are fully

Throughout the year, the "Healthy Elements" program offers employees in several US entities, as well as their spouses, medical tests (for example, cholesterol levels), individual support to improve their health (for example, measures to help stop smoking) as well as challenges to encourage cardiovascular activities.

In Canada, Air Liquide has shared a list of checks and practical advice with its employees to prepare individuals and sites for the winter.

understood. When suppliers themselves subcontract, they must also follow and comply with the same rules and this must be included in the contractual provisions.

Regular meetings with subcontractors at the managerial and operational level are organized to discuss the culture of safety, their compliance with life-saving rules, feedback or analysis of any accidents or near-miss incidents.

2. Ethics

Integrity and transparency are the cornerstones of the Group's ethical approach. They govern behaviors and actions. Integrity includes honesty and impartiality. Transparency is based on the principles of sincerity and openness. Individual and collective commitment is key to adopt ethical behavior based on integrity and transparency.

The Group's ethical approach is structured so that rules of conduct are shared and respected by all, in particular in regards to the respect for Human Rights, social rights and the environment.

This approach is set out in an Ethical program which includes the following points:

- behavior expected from all employees which are part of the General Statement of the Group's Principles of action described page 69;
- the tools: codes relayed through internal procedures;
- the awareness-raising and training program;
- the whistleblowing and control system.

To support the roll-out of this Ethical program, a dedicated organization has been set up:

- an Ethics Committee, composed of Air Liquide's various global functions (Human Resources, Legal, Group Control, Operations, Sustainable Development Departments, etc.), validates the Ethical program's guidelines and may, if necessary, make post-fraud sanction recommendations;
- the Group Control Department, which is responsible for Ethics, reports directly to one of the Group's Executive Vice-Presidents;
- an Ethics Officer is responsible for providing advice and support to entities in the implementation of the four above-mentioned areas and in the treatment of fraud and deviations. This Officer also suggests improvements to the Ethical program by integrating strategic challenges, best practices and regulatory developments. For example, the Ethics Officer integrated the anti-corruption obligations set out in the Sapin 2 Act into the Group's existing procedures. He relies on a network of ethics correspondents present in each of the Group's geographic regions and World Business Lines.

2.1. Codes and procedures

Rules for ethics and conduct, which are shared and actively circulated among all Group employees through the BLUEBOOK, are set out in particular within the Code of Conduct and the anti-corruption Code of Conduct.

The BLUEBOOK is the Group's reference framework which includes policies, codes and procedures which apply to all the entities. This reference framework is accessible to all employees.

The Code of Conduct: employees' ethics charter

Each Group subsidiary must implement an ethics charter known as the Code of Conduct. This decentralized approach combines respect for local customs and regulations and the Group's ethical commitment. The subsidiaries thus embrace the Group's ethical principles by writing their own Codes of Conduct themselves in their working language.

In 2017, 97% of the Group's employees belonged to subsidiaries that have a local Code of Conduct. The employees who do not yet have a local Code of Conduct primarily belong to entities recently acquired by the Group and undergoing consolidation. Currently, these Codes of Conduct have been translated into more than 20 languages to ensure their appropriation by Group employees.

The implementation of this ethics charter must adhere to the following key concepts:

- respect for laws and regulations;
- respect for people: health and safety conditions in the workplace, prevention of discriminatory actions, respect for third parties;
- respect for the environment;
- respect for competition law;
- respect for rules on market abuse, particularly insider trading;
- prevention of conflicts of interest: links to a competitor, customer or supplier, respect for anti-corruption and bribery rules;
- protection of Air Liquide's activities: protection of information, property and resources;
- transparency and integrity of information;
- internal controls and audits;
- sanctions for disregard of the Code of Conduct.

Full details of these key concepts are available in the Group section of the website at <https://www.airliquide.com/group/key-principles-code-conduct>.

An e-learning module exists on the Employee Code of Conduct. It introduces the Group's ethical approach and presents key concepts through case scenarios. This module is mandatory and must be followed by all employees each year.

The anti-corruption Code of Conduct

Within the Group, the anti-corruption program demonstrates the importance of this subject and underlines Air Liquide's commitment to preventing acts of corruption.

As part of this program, the Group has formalized an anti-corruption Code of Conduct. This Code has been made available to all entities and an extract is available on the website at <https://www.airliquide.com/group/anti-corruption-code-conduct>. This anti-corruption Code of Conduct provides a reminder of the anti-corruption laws and deals with relations with intermediaries, particular cases such as mergers, acquisitions and partnerships, types of payments requiring particular attention, as well as administrative and accounting traceability requirements and sanctions applicable in the event of non-compliance with this Code.

Moreover, the Group also has a Supplier Code of Conduct which includes a chapter on the prevention of corruption.

An e-learning module covers the anti-corruption Code of Conduct. It is primarily intended for those teams which are most exposed to corruption-related risks (sales, procurement, administrative management, and so on) and managers. This training is mandatory each year and, in addition, these categories of employees also attend classroom-based training every three years.

Respect for Competition Law

Codes at the Group level were established in regard to proper behavior concerning respect for competition law, especially in Europe and the United States. The most important rules on competition law are also included in the employees' local Codes of Conduct. For some of the Group's activities, Healthcare in particular, specific Codes of Conduct on competition law have also been developed.

Audits are jointly conducted on a regular basis by the Group's Internal Audit Departments and an external attorney. They carry out tests and interviews to identify and correct practices at risk in this area or any deviations observed. Awareness-raising meetings on compliance with competition law are regularly held throughout the Group. Finally, an e-learning program was launched at the Group level on competition law-related practices and international principles.

2.2. The whistleblowing system

The Group has a formal whistleblowing system at all its entities, whereby employees can anonymously alert an independent external service provider of any deviations from the Code of Conduct of their entity. Employees can file this alert in their own language by telephone or through the provider's dedicated website, accessible via the Group's Intranet. All reports are dealt with confidentially and as quickly as possible. The Group guarantees that any employee who reports something in good faith will not be sanctioned or any retaliatory measures taken. It also reiterates in the Code of Conduct that the processing of reports is supervised by the Group's Ethics Officer.

This system is an additional solution to the usual process for reporting incidents within the entities: through managers and the Human Resources teams. It helps to accelerate the processing of reports

received, and thus to minimize their potential impact on individuals and the organization.

180 reports were received during 2017 mainly from the United States, Brazil, the United Arab Emirates and France, as well as from 22 other countries. Human Resources issues accounted for 78% of reports and the remaining 22% covered fraud or potential conflicts of interest and other subjects such as safety, for example. Around one third of reports processed were sufficiently detailed to implement correctional measures or disciplinary sanctions which led in around 15% of cases to the departure of an employee. The whistleblowing system is also accessible to external collaborators (temporary workers, service providers, etc.)

3. Respect for Human Rights and the environment

Air Liquide is dedicated to the highest standards for the conduct of its business. Air Liquide, through its Chairman and Chief Executive Officer, has signed the United Nations Global Compact, an initiative in which the 10 founding principles relate to Human Rights, international labor standards, the environment and the fight against corruption.

- Businesses should support and respect the protection of internationally proclaimed Human Rights.
- Make sure that they are not complicit in Human Rights abuses.
- Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.
- The elimination of all forms of forced or compulsory labor.
- The effective abolition of child labor.
- The elimination of discrimination in respect of employment and occupation.
- Businesses should support a precautionary approach to environmental challenges.
- Undertake initiatives to promote greater environmental responsibility.
- Encourage the development and diffusion of environmentally friendly technologies.
- Businesses should work against corruption in all its forms, including extortion and bribery.



Air Liquide also complies with the international rules of the International Labour Organization (ILO) in terms of labor law and follows guidelines for multinational companies issued by the OECD. These Guidelines encourage the reasonable conduct of companies in terms of professional relationships, Human Rights, the environment, taxation, the publication of information, anti-corruption, the interest of consumers, science and technology, and competition.

Moreover, Air Liquide has signed the Responsible Care® Global Charter, an initiative of the International Council of Chemical Associations (ICCA) which aims to improve global performances in the chemical industry in terms of health, safety and the protection of the environment.



4. Vigilance plan

The aim of the vigilance plan is to identify risks and prevent serious violations with respect to Human Rights and fundamental freedoms, to the health and safety of persons and to the environment, which may result from the activities of the Group, its affiliates, or suppliers and subcontractors with whom Air Liquide have an established business relationship. These actions fall within the scope of the French law of March 27, 2017 which introduces into French law a "duty of vigilance on the part of parent companies and contracting companies".

Air Liquide's vigilance plan applies to all Group subsidiaries, subcontractors and suppliers with whom the Group have an established business relationship. The plan is applied as follows:

4.1. Related risks

In order to refine Air Liquide's main environmental and societal risks related to the vigilance plan, mapping covering all Group businesses was applied based on the Group's main risk map. The main risks identified are those relating to health and safety, in particular industrial risks and risks to individuals, as well as accidental pollution risks.

Moreover, supplier mapping has been carried out based on the methodology drawn up by the Group Procurement Department. This methodology allows subsidiaries to identify the suppliers which present the highest levels of risks in terms of sustainable development taking into account the following parameters:

- the supplier's activity;
- the geographic location of the supplier;
- Air Liquide's annual expenditure with the supplier;
- the supplier's dependency ratio to Air Liquide.

The Group Procurement Department, in partnership with EcoVadis, allocates a risk level to each purchasing category and draws up a list of high-risk countries. Factsheets present sustainable development challenges specific to certain purchasing categories and certain geographic locations. These enable buyers to identify the most critical subjects and provide substance for discussions with suppliers.

The identification of critical suppliers by subsidiaries was introduced in 2017, in anticipation of regulatory changes, and will continue in 2018.

4.2. Regular assessment of subsidiaries, subcontractors and suppliers

All Group subsidiaries are subject to social, safety and environmental reporting each year. Data is reported, analyzed, consolidated and published in the Group's Sustainable Development Report. This data is audited by the independent verifier and is subject to an action plan when non-compliance with Group expectations is identified.

In addition to these reportings, audits will gradually be launched by the internal audit teams and their counterparts in the different Hubs.

For suppliers recognized as critical, the Group regularly carries out, with the support of EcoVadis, comprehensive performance evaluations covering the following subjects: environment, social, business ethics and their procurement policies. Since this approach was introduced in 2010, more than 900 suppliers have been assessed in this way, of which almost 200 in 2017.

Air Liquide's ambition is to assess all critical suppliers by 2020.

4.3. Risk mitigation measures and the prevention of serious harm

Air Liquide has formalized in a set of documents called the BLUEBOOK, its values, policies, procedures and internal Codes of conduct. The aim of the BLUEBOOK is to:

- spread good practices among the Group;
- mitigate risks;
- accompany Group development;
- feed the Local Management System of each entity.

In terms of safety and the environment, the IMS provides a framework for operations.

To reduce risks and prevent the grave abuse of Human Rights by suppliers, ensure the health and safety of individuals, and protect the environment, Air Liquide has formalized the following minimum requirements.

The Supplier's Code of Conduct drawn up by Air Liquide is routinely sent to all Group suppliers in order to promote and enforce practices relating to Human Rights, ethics, the environment and safety. This Code, which can be found on Air Liquide's website, applies to existing and new suppliers.

Air Liquide expects each of its suppliers to respect the Group's ethical principles and ensure that all their employees and subcontractors comply with this Code of Conduct.

The Supplier Code of Conduct is based on internationally recognized principles such as the Universal Declaration of Human Rights, the United Nations Guidelines on companies and Human Rights, the United Nations Global Compact, OECD Guidelines for Multinational Enterprises and the fundamental conventions of the International Labour Organization (ILO). It imposes on suppliers, in particular,

the prohibition of child labor and forced labor, that they guarantee decent and healthy working conditions without danger for all employees, that they fight against corruption and that they respect the environment and the preservation of natural resources.

A sustainable development clause is included in the Group's new contracts and framework agreements. This clause covers the option for Air Liquide to assess the supplier's sustainable development performance, as well as the obligation to implement adequate corrective measures. It also includes a compulsory reporting element for the supplier, in particular on safety, energy and water consumption and atmospheric emissions, and human resources.

During the assessment of suppliers' performances in terms of sustainable development:

- suppliers performing below Air Liquide's sustainable development expectations are examined and are presented with a corrective action plan that may go as far as the disqualification of the supplier;
- progress made is monitored by Air Liquide during performance reviews, the frequency of which varies according to the score obtained by the supplier (from one year for suppliers with an unsatisfactory score, and up to five years for the best performing suppliers).

Since 2014, the Group also conducts on-site Sustainable Development audits for certain suppliers that are considered to be particularly at risk in this area, due to unsatisfactory evaluations. These audits mainly cover social and environmental factors. They are conducted according to recognized external benchmarks, often by a specialized external auditor. Around ten on-site audits of suppliers were carried out, in Asia, South America and Europe. Following these audits, corrective action plans were drawn up. In certain cases, business relationships were suspended while the supplier brought its practices into compliance.

4.4. Whistleblowing mechanism and compilation of reports

The current whistleblowing tool, Ethicall, allows employees, and more recently external collaborators, to report deviations from the Code of Conduct, including on subjects relating to Human Rights, health, hygiene

and safety in the workplace as well as environmental protection. Wider use of this whistleblowing tool as part of the Group's vigilance plan is currently being considered.

4.5. Monitoring system

The monitoring system, including key indicators and reports on actions, will be described in the 2018 Sustainable Development Report.

The Board of Directors' Environment and Society Committee will be informed of the monitoring of these actions.

➤ SUSTAINABLE DEVELOPMENT STRATEGY

1. The Group's ambition

Air Liquide's ambition is to lead its industry, deliver long-term performance and contribute to sustainability.

The major environmental and societal challenges, such as the climate, air quality and access to care, also represent growth opportunities for the Group. The Sustainable Development strategy is part of this dynamic, proposing solutions to these environmental and societal needs in an innovative and competitive manner.

In certain situations, temporary support is required to develop or implement solutions. The Air Liquide Foundation therefore contributes to fundamental research and local development.



Air Liquide's contribution to the United Nation's Sustainable Development Objectives

Air Liquide contributes through its business and its commitment to reach certain Sustainable Development Goals (SDGs) introduced by the UN to eradicate poverty, protect the planet and guarantee prosperity for all by 2030.

For clarity, each action of the Corporate Sustainability Program will indicate the associated SDGs.



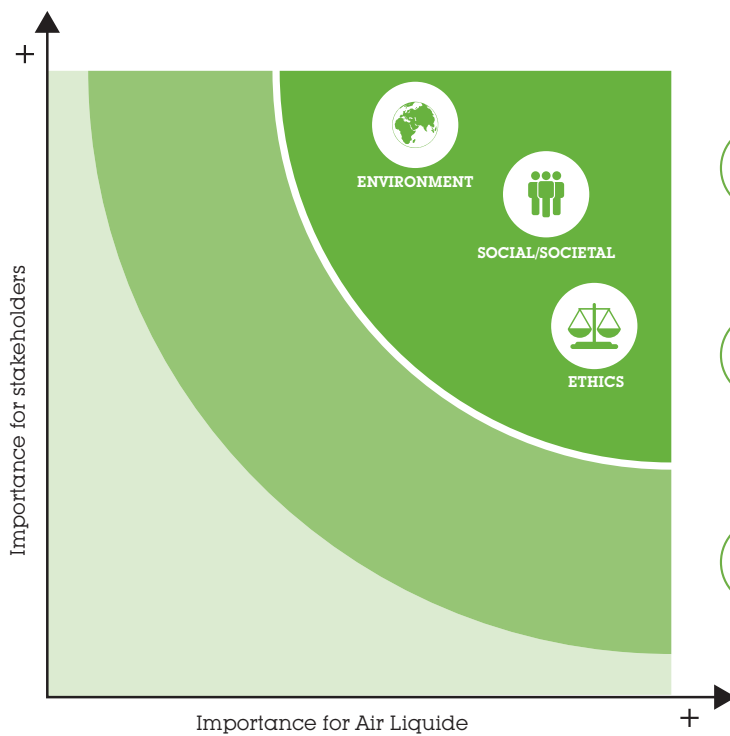
2. Air Liquide's main Sustainable Development stakes

To remain relevant in its approach, Air Liquide regularly reviews its own sustainable development stakes through consultations with its stakeholders.

In 2015, Air Liquide consulted its stakeholders on these stakes and the importance they place on them. This consultation allowed Air Liquide to draw up a map^(a) (or a materiality matrix).

Following this initial consultation, ten sustainable development stakes were identified and classified according to these categories: environment, social & societal, and ethics.

MAPPING OF SUSTAINABLE DEVELOPMENT STAKES



10 most pertinent CSR stakes

- Production energy efficiency
- Mitigation of greenhouse gas emissions
- Products and services protecting life and the environment^(a)
- Dialogue with stakeholders
- Innovation linked to protecting life and the environment^(a)
- Health and Safety^(b)
- Employee development
- Human Rights
- Shareholder dialogue
- Ethics / Internal Governance

(a) Particularly for climate change and air quality.

(b) Including the safety of Group employees, subcontractors, and temporary workers; the safety of Air Liquide facilities, product transport safety; safety of products and their implementation at the customers' sites.

Of these ten stakes, Air Liquide believes that safety, ethics and the respect of Human Rights and the environment are prerequisites for any action carried out by the Group.

Air Liquide seeks to ensure that these key stakes remain based on its operations and, in 2017, the Group launched a survey of its Managing Directors across all countries in which it operates.

Moreover, Air Liquide, in partnership with other French industrial groups and an external body, launched the first joint materiality survey of French civil society. This survey of a representative sample of the population (more than 1,000 individuals), highlighted that the environment, and more specifically air quality and the climate, are unavoidable social challenges for the years ahead. Human Rights, healthcare, integration and job creation were also deemed to be major priorities. Finally, those surveyed felt that industrial companies should play greater roles in responding to some of these challenges.

(a) The methodology used is described page 120.

3. The two lines of action of the Group's Sustainable Development strategy

Moreover, Air Liquide affirms its ambition to contribute to a more sustainable world. For these reasons, given its understanding of the issues at stake, the Group has drawn up a Sustainable Development strategy which covers two of the lines of action defined in its NEOS company program:

- improve air quality and prevent global warming;
- strengthen dialog with stakeholders.

These two priorities, along with Air Liquide's businesses, drive the Corporate Sustainability Program (CSP) implemented by the Group. The

latter relies heavily on its operations, but also implements measures in favor of local development, notably through its Foundation. Thus:

- in response to the societal and environmental challenge of improving air quality and preventing climate change, the CSP applies to operations to develop solutions for cleaner industry and cleaner transportation;
- to contribute to the societal challenge of strengthening dialog with stakeholders, the CSP undertakes actions mainly in favor of local development, primarily through its Foundation's projects.

4. Background information

4.1. A shift in ecosystems

Regulatory changes in favor of the climate and air quality

Several regulations governing the climate and the environment have been enacted through the world in recent years: including the Paris Agreement, Article 173 of the energy transition law and Grenelle II in France, the Air Quality Plan in the United Kingdom, among others. Air Liquide's multi-disciplinary teams anticipate these regulatory changes to provide a proactive response.

Countries are actively committed to ambitious climate policies, including several European countries and China which is investing massively in wind power and electric mobility. Territories are also actively committed to reducing their environmental footprint: towns and cities are aiming to make the switch to 100% renewable energy sources, polluting vehicles have been banned from certain city centers and greener public transport is being introduced.

Nonetheless, to reach the level of commitments championed in the Paris Agreement, the major involvement of industrial players is also required.

The Paris Agreement

The Paris Agreement was signed at the end of 2015 during the COP21 and showcased the desire of almost all states to limit the increase in the planet's average temperature to under 2°C compared with the pre-industrial era. This agreement has now been signed by 195 countries (and the European Union).

According to certain predictive models^(a), limiting an increase in temperature to 2°C at the most requires limiting the total cumulative emissions of carbon dioxide (CO₂) in the atmosphere to 2,900 gigatons (Gt) of CO₂. This is called the "carbon budget".

Considering what humans have already emitted, there remains around 900 Gt "that can be emitted" to limit the temperature increase to 2°C. At the current pace of emission of 40 GtCO₂ per year, the budget will be fully used in 25 years. Of the 40 GtCO₂ (or 40,000 Mt) emitted each year, only 200 Mt is recovered in various industries such as enhanced oil recovery (which helps significantly increase oil extraction from an oil field), food preservation and the gasification of water and fizzy drinks.

(a) IPCC - Climate Change 2014: Synthesis Report - <http://www.ipcc.ch/report/ar5/syr/>

4.2. Air quality

Living well in towns and cities in terms of health and well-being has become a challenge of attractiveness for large metropolitan areas.

According to the World Health Organization, more than 80% of the population is affected by air quality issues. Hundreds of millions of people breathe in highly polluted air which leads to the premature death

of 3.5 million people each year and major costs for society running into hundreds of billions.

Air Liquide contributes to improving air quality in industry, transport and throughout its value chain. The Group's activities, its expertise in terms of air, breathing and healthcare as well as its products and services related to the energy transition, enables it to work towards improving air quality.

4.3. Climate change

Air Liquide has introduced concrete measures as part of its Corporate Sustainability Program (see pages 81-92) in a response to climate stakes by developing solutions which reduce greenhouse gas emissions.

CO₂, a molecule which is essential to life, involved in climate change

CO₂, or carbon dioxide, is a colorless and odorless gas present in the air at about 0.04%. It contributes to making our planet habitable by playing a key role in the regulation of the average temperature of the Earth's surface (15°C). Without CO₂ in the atmosphere, its temperature would fall below 0°C, putting life on Earth at risk.

CO₂ contributes to approximately 20% of the natural greenhouse effect, through its ability to absorb heat. CO₂ and methane are the main Greenhouse Gases (GHG). It is now common to express greenhouse gas emissions in "CO₂-equivalent".

Almost 40 GtCO₂ are emitted each year by human activity, 60% of which remain stored in the atmosphere.

To avoid negative consequences for the climate, permanent solutions must therefore be implemented to decrease CO₂ emissions, store CO₂ elsewhere than in the atmosphere and recover more CO₂.

4.4. Local development

Air Liquide is present in communities for which respect is at the heart of the Group's concerns.

The Group implements philanthropic actions to protect the environment and life and to promote local development. The Air Liquide Corporate Foundation illustrates the Group's commitment to sustainable



The Air Liquide Foundation and the Climate

The Foundation also supports scientific research in the field of environmental protection. For example, the Foundation has renewed its support to the WHY Expéditions association for an environmental scientific exploration - Under The Pole III - in Greenland and in the archipelagos of French Polynesia. The research teams and the Under the Pole divers study the role of ecosystems in climate change: the sequestration of CO₂ deep in the Arctic Ocean and the emission by the Polynesian coral reefs of a gas called dimethylsulfide (DMS). Scientists believe that this gas plays an important role in the creation of cloud cover and therefore in climate change. Clouds partly reflect the sun's rays which alleviates global warming. The original feature of this research is the depth at which the study will be carried out. The expertise of the Under The Pole III divers will allow the team to explore coral reefs that are between 30 and 150 meters under water. The composition of these reefs and their role in the interactivity between the ocean and the atmosphere remain relatively unknown.

development, and aims to support projects in the countries where the Group operates.

These philanthropic actions are implemented either directly by the Group's subsidiaries, or via the Air Liquide Foundation.

5. Strategy management and implementation

In May 2017, the Board of Directors created a new committee, the Environment and Society Committee (ESC) whose mission is to assess the Group's strategy and commitments in terms of sustainable development and draw up any relevant recommendations.

The ESC monitors the Group's environmental and societal actions. It focuses in particular on subjects relating to air quality, energy consumption, greenhouse gas emissions, and measures implemented by the Foundation. The ESC also examines environmental risk management as well as the quality of the Group's reporting in this field. The Committee's missions are described on page 147, chapter 3 of the 2017 Reference Document. The Committee meets in principle twice a year.

As part of its NEOS 2016-2020 company program, the Group introduced a Corporate Sustainability Program (CSP), which supports the development of solutions for environmental and societal needs.

To ensure that this program is rolled out at the operations level, a PMO (Project Management Office or project team) has been set up. The PMO ensures that operating entities implement the aims defined by the Group and introduce monitoring indicators. It also suggests criteria for variable remuneration related to this program for Group managers.

Moreover, the PMO steers a working group composed of various Group departments, the aim of which is to draw up the Group's climate objectives.

THE CORPORATE SUSTAINABILITY PROGRAM

In the past year, Air Liquide has been rolling out its Corporate Sustainability Program (CSP) within the Group to build projects and launch measures that improve air quality and which will limit climate change.

The CSP aims to protect the planet and its inhabitants. It includes:

- solutions for clean industry;
- solutions for clean transport;
- measures to promote local development.

1. Solutions for clean industry

Industry accounts for one third of total direct and indirect greenhouse gas emissions^(a). A 10% reduction in greenhouse gas emissions in industries supplied by Air Liquide, such as the steel and chemistry industries, would reduce emissions by 900 million tons of CO₂-equivalent each year.

In order to reduce its environmental footprint and that of its customers, Air Liquide offers products and services which have a low impact on air quality and the climate. To do so, the Group is improving the carbon content of its solutions as well as those of its energy purchases. Air Liquide has made these solutions a competitive advantage.

Almost 60% of the Group's innovation expenses in 2017 were related to work to improve air quality, health and the environmental footprint.

Close to 30% of the Group Innovation expenses is devoted to reducing CO₂ emissions (by reducing carbon content of its products or those of its customers).

Numerous applications of industrial and medical gases protect the environment for the Group's customers and the life of patients. These applications represent more than 40% of Group revenue in 2017.

1.1. Contribute to the reduction of industrial emissions



The use of industrial gases during certain processes and over-the-fence supply of products and services enable the Group's industrial customers to reduce their greenhouse gas and atmospheric pollutant emissions.



Air pollutants

Particulate Matter (PM)

Affects more people than any other pollutant. It is composed of a mix of sulfates, nitrates, ammonia, sodium chloride, black carbon, mineral dust and water. Reduces life expectancy 6-18 months*. PM10 concentrations should be < 20µg/m³.

Nitrogen oxide (NOx)

Can cause inflammation of the airways (asthma, lung conditions); also a source of particulate matter & O₃. NOx concentrations should be < 40µg/m³.

Sulfur oxide (SOx)

Can affect the respiratory system. It is also responsible of acid rain. Concentrations should be < 20µg/m³.

* Data from World Health Organization.

(a) Source: World Bank.

The use of oxygen to reduce CO₂ emissions

Air Liquide supplies the steel industry with significant volumes of oxygen to reduce CO₂ emissions during oxy-combustion processes:

- the injection of oxygen in blast furnaces reduces the consumption of coke, whose production and use release an important volume of CO₂ and other pollutants, by partially replacing it with pulverized coal or natural gas;
- the use of oxygen in electric furnace burners can significantly reduce their consumption of electricity.

A detailed methodology has been introduced in order to assess the avoided CO₂ emissions through these two oxy-combustion applications. It is based on an analysis of the oxygen volumes supplied by Air Liquide in 2017, site by site and customer by customer. The avoided emissions are calculated by using ratios derived from the modeling of customer processes.

Air Liquide thus estimates that these uses of oxygen have helped avoid the emission of 11.5 million tons of CO₂ broken down as follows:

- 11 million tons related to the injection of oxygen into blast furnaces;
- 0.5 million tons related to the use of oxygen in electric furnace burners.

In the glass manufacturing industry, heat oxy-combustion is another innovative technology which makes the oxy-combustion process even more efficient. It consists of extracting heat from combustion fumes in order to heat oxygen and fuel, thus improving the performance of the process by 10%. Compared to air combustion, this technology provides up to 50% energy savings and up to 50% CO₂ emission reductions. These oxy-combustion technologies reduce the nitrogen oxide emissions of glass furnaces by 60% to 95%.

This technology is of particular interest for the Chinese market which represents about 50% of worldwide glass production.

Over-the-fence supply: an efficient solution for the planet

Air Liquide is well known for its expertise and the efficiency of its processes and produces the necessary industrial gases to meet its customers' needs. This helps significantly reduce energy and raw material consumption and, as a result, the CO₂ emissions of the entire value chain. In total, 4.6 Mt of CO₂ emission have been avoided in this way (see details page 85). So, even though Air Liquide's GHG emissions tend to increase with the volumes of industrial gases produced, this over-the-fence supply nevertheless minimizes the global environmental footprint of its customers' products.

The CO₂ market

CO₂ is a greenhouse gas that can have negative consequences for the climate in large concentrations. To avoid these consequences, permanent solutions must therefore be implemented to decrease CO₂ emissions, store CO₂ elsewhere than in the atmosphere and recover more CO₂. Most countries committed to implementing such solutions as part of COP 21.

Recovering CO₂ involves using it as a raw material in the food, chemical and transport industries. It is a promising market: in 2017, 3.5 million tons of CO₂ were purified and delivered to customers by Air Liquide.

In France, Air Liquide operates the first commercial CO₂ capture unit using a cryogenic process at a hydrogen production unit. Cryocap™ H₂ captures up to 90% of CO₂ emissions while at the same time increasing production at the hydrogen unit by 5%. Cryocap™ captures 100,000 tons of CO₂ each year, which is used by the region's greenhouses and by the food industry for the carbonation of sparkling drinks.

Air Liquide has adapted the Cryocap™ technology to electrical power plants, thus providing its customers in this industry the ability to capture large quantities of CO₂ and reduce their atmospheric emissions. This technology is called Cryocap™ Oxy.

CO₂ is becoming a commodity for manufacturing concrete for construction. The partnership between Air Liquide and US start-up Solidia Technologies develops and markets a "sustainable concrete". Solidia's process, which hardens concrete with CO₂ instead of water, reduces the environmental footprint of the pre-cast concrete by up to 70%.

This technology also reduces the hardening time of the concrete to less than 24 hours and the required amount of water. In addition to capturing large quantities of CO₂, the quality of the concrete achieved is greatly improved.

Hydrogen for sustainable steel production

Steel is an essential material in modern life. Steel recycling is already well organized, but its production generates very high levels of CO₂. Air Liquide has been exchanging and working in R&D for many years with its customers in the steel industry to implement solutions aimed at reducing these CO₂ emissions. For example, Air Liquide was part of the ULCOS European consortium which studies more than 80 innovative technologies aimed at achieving this goal.

The use of hydrogen produced by water and electricity electrolysis is a promising approach to reducing industrial CO₂ emissions. Hydrogen injected into a traditional blast furnace helps reduce coal consumption and therefore the quantity of CO₂ emitted per ton of steel (a 10-15% reduction could be possible).

Another solution which could help reduce CO₂ emissions by up to 80%, is in the preliminary research phase at several major steel groups. This solution involves using hydrogen, again produced in a carbon-free manner, to achieve the direct reduction of iron ore (or "DRI") without the use of coal.

Today's challenge is therefore to create favorable economic conditions so that these virtuous technologies are optimized via test and pilot schemes, then rolled out.

Air Liquide has used medium-sized electrolyzers for on-site hydrogen production for many years. To meet the needs of the iron industry, large scale projects are currently being studied.

Water treatment solutions at customers' sites

Only 64% of the world's population has access to drinking water and 80% of wastewater is discharged into the environment without any treatment^(a). Moreover, the world's population is expected to increase from 7.5 to 9 billion inhabitants by 2050, but the quantity of available fresh water will remain the same. Finally, the scarcity of water and environmental challenges are leading industrial players to seek reliable

and economic technologies to treat and recycle water. Air Liquide has been a benchmark in water treatment for 35 years, and provides its customers with adapted solutions for the production of drinking water, the treatment of wastewater, cooling water and pH testing:

- using pure oxygen to replace the air injected into the biological basins that are used in the wastewater treatment process increases the basins' treatment capacity by up to 50%;
- Air Liquide helps replace mineral acids with carbon dioxide in order to test the pH value of the water (and therefore its acidity) in a safer and more environmentally friendly manner;
- to eliminate bacteria and viruses, the Group produces and sells ozone which, thanks to its greater oxidizing power than chlorine for example, disinfects water quicker and without leaving a residual smell or taste. This also improves the efficiency of later treatment.

1.2. Develop products with a low environmental footprint



The Group strives to improve the energy and environmental footprint of its products and services.

Sustainable Development criteria in the Group's investment decisions

Sustainable Development criteria, particularly those relating to greenhouse gas emissions, water consumption and relations with local communities, are included in the decision-making processes of the main Group investments.

Moreover, for all major projects, Air Liquide incorporates an internal carbon price of 50 euros per ton in its investment decision process. This internal carbon price is voluntarily set by Air Liquide in order to assess the economic cost of greenhouse gas emissions. The analysis of each project using this internal carbon price ensures the sustainability of the customer's project. It also helps validate the relevance and viability of the investment solution envisaged by Air Liquide compared with alternative solutions.

"Buy clean": the Group's electricity procurement

69%

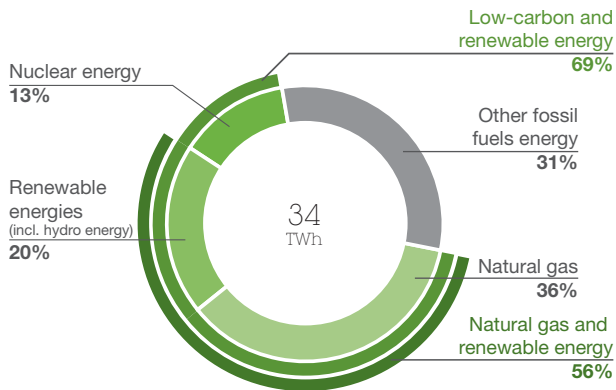
The percentage of electricity consumed by the Group which is low-carbon or renewable (up 15% over the past five years).

The role of energy procurement is essential for Air Liquide, in particular for its impact on the Group's indirect emissions (Scope 2).

The Group's energy procurement policy favors the purchase of electricity from suppliers who have made the choice to produce low-carbon solutions. Each time an electricity supply contract is up for renewal and for each new contract, Air Liquide always takes into account the suppliers' primary energy mix to assess and select its electricity suppliers. In 2017, this criterion was decisive for the renewal of contracts in Germany and Chile. Moreover, to step up the pace of the transition towards supplying electricity with lower carbon content, Air Liquide launched an initiative in 2017 to sign renewable electricity procurement agreements with competitive wind and/or solar power suppliers. This initiative has already helped identify major opportunities, which should lead to procurement decisions in 2018.

By taking into account the different natures of primary energy used to produce electricity in the countries where Air Liquide is present, it is then possible to calculate a global breakdown by nature of the electricity used. This calculation takes into account the electricity produced from natural gas by the Group's cogeneration units. In 2017, 20% of electricity consumed was from a renewable source and 36% from natural gas composed mainly of methane, a molecule which contains a carbon atom and four hydrogen atoms, the combustion of which generates around two-times less CO₂ emissions than coal per kWh of electricity produced. Moreover, the combustion of natural gas produces small amounts of atmospheric pollutants.

(a) Water Quality and Wastewater on unwater.org (2017, Unesco).

ORIGIN OF ELECTRICITY USED IN 2017 ^(a)

(a) Calculation takes into account the primary energy source that each country uses to produce electricity (source: International Energy Agency).

Air Liquide's energy efficiency

Air Liquide has always been concerned with minimizing its energy consumption and environmental footprint as well that of its partners and customers.

Through its Engineering & Construction activity, the Group designs its own production units. For example, it adapts the design of these units to customers' needs, technological developments and energy costs.

Air Liquide also operates air separation units and hydrogen units and therefore benefits from a virtuous circle of steady improvement from the design stage through to the units' operation.

Old units are replaced by new ones that are more energy efficient whenever circumstances enable it.

Air Liquide builds increasingly large units that generally have a better energy efficiency, thanks to scale effects.

For example, the oxygen production unit for SASOL in South Africa enables energy savings up to 30% compared with the first unit provided to SASOL by Air Liquide in the 1980s.

The significant improvement in SMR technologies (hydrogen production) by Air Liquide has become real with SMR-X. This technology has enabled the production of hydrogen without simultaneously producing steam, leading to a 5% decrease in natural gas consumption compared to conventional technology.

Large units are often interconnected through a pipeline system supplying a customer industrial basin. This system creates energy production and consumption synergies. The steady development of the oxygen, nitrogen and hydrogen pipeline systems helps improve their energy efficiency. Lastly, smart technologies are being rolled out in order to centralize the monitoring and management of large units so that production can be adjusted to customers' needs.

Reliability

Air Liquide has also set up a program in order to improve the reliability of its units' operation. In addition to providing better service to customers, this has direct consequences on energy efficiency. Every shutdown and start-up of these units creates a sequence that consumes energy. Increasing reliability, i.e., reducing the number of untimely shutdowns, results in more energy-efficient production units.

The Green Origin offer

The Green Origin offer, which is marketed in certain countries, is an additional option for standard liquid industrial gases supply agreements, to guarantee that these gases are entirely produced using renewable energies. The energy required to produce and transport the gases in this offer is compensated by the purchase of renewable energy certificates and CO₂ emission rights.

Air Liquide thus contributes to the development of renewable energies and provides its customers with the possibility of improving the environmental footprint of their supply chain. As part of this offer, a certificate is given to customers by an external control organization.

Energy production through cogeneration

Certain technologies developed by the Group allow energy to be produced in a cleaner manner.

Cogeneration units operated by Air Liquide produce heat and electricity simultaneously. They consume natural gas and water, mostly converted into steam and supplied to customers. The steam can be condensed in customers' processes and then reused in the cogeneration unit. In most cases, the electricity produced is supplied to the local electricity distribution network, which in some countries can be used to power other units of the Group. Combustion of natural gas produces CO₂ and leads to low nitrogen oxide (NO_x) emissions, but practically no sulfur oxide (SO_x) emissions.

Greenhouse gas emissions avoided in operations

Energy efficiency is a key focus of the Group's business lines and activities, with the Group constantly striving to improve its energy and environmental footprint. This optimization is a combined result of:

- technological solutions in production processes;
- scale effects, co-production and synergies, in particular through the development of its pipeline systems;
- the operational optimization of its production units;
- and the solutions chosen for energy and raw materials supplies.

The set of products and services that Air Liquide supplies enable its customers to consume less energy, and as a result avoid more CO₂ emissions than an "alternative reference system" where customers own and operate their own production units.



Digital solutions driving energy optimization

The Smart Innovative Operations program developed by Air Liquide is based on the automation and centralization of operations, anticipating outages and optimizing the performance of a plant. It uses the operational data of production units and analyses it to optimize equipment maintenance and anticipate incidents. Measures which, in the end, will provide a better service to customers for whom the reliability of the gas supply (oxygen, nitrogen or hydrogen) is essential.

The Group has already deployed its digital predictive maintenance tools at 15 sites worldwide (including China, Japan, Singapore, Germany, Belgium, Russia, Argentina, the United States and Saudi Arabia).

The performance optimization program was successfully implemented in 2016 in the United States for the hydrogen unit network along the Gulf Coast. This program combines economic and environmental performance through the reduction of the plants' energy consumption.

In 2015, the Group introduced a detailed methodology in order to assess the corresponding avoided CO₂ emissions. This assessment is carried out within the Large Industries activity, which represents 90% of the Group's energy consumption, and thus CO₂ emissions. The methodology is based on an analysis of the total volume of industrial gases supplied to customers over 2017, site by site and customer by customer, i.e., at over 1,400 delivery points per pipeline. For each customer facility, we assess the emissions of the reference system by modeling the energy consumption and CO₂ emissions, both direct and indirect, that would be generated by a production unit dedicated to supplying the facility. This model is based on a protocol which takes into account the latest developments in terms of energy efficiency, as well as the size and type of production unit.

Air Liquide therefore estimates that the total emissions avoided by its production operations in 2017 were 4.6 million tons of CO₂, most of which is broken down as follows:

- 1.4 million tons of indirect CO₂ emissions for the supply of air gases;
- 2.2 million tons of direct CO₂ emissions for the supply of hydrogen and carbon monoxide;

- 0.9 million tons of direct CO₂ emissions for cogeneration units that produce steam and electricity from natural gas simultaneously, which are on average 20% more efficient in terms of CO₂ emissions than technologies which produce steam and electricity separately.

Moreover, in the Industrial Merchant activity, small on-site nitrogen, oxygen and hydrogen units reduced truck deliveries, a source of CO₂ emissions. In 2017, these on-site units saved 57.2 million kilometers in truck deliveries, thus avoiding 57,500 tons of CO₂ emissions.

Water management

In 2017, Air Liquide used 81 million m³ of water, broken down as follows:

- approximately 60% by air separation units for cooling air after compression. 70% of this water is evaporated and 30% is treated on-site or by treatment plants in neighboring municipalities;
- approximately 40% in other industrial processes such as hydrogen production units and cogeneration units. Approximately 80% of the water used by these units is supplied and then consumed in the form of steam by Air Liquide's customers.

With regard to air separation units, there are several types of cooling systems. Around 82% of these units have semi-open water recirculating systems which require back-up water. Around 8% of these units have open systems. In such cases, water comes from natural resources or third-party industrial systems. It is discharged back into the original source, without causing pollution or changing the water's physical-chemical characteristics. Lastly, around 6% of these units have closed systems that consume no water. 4% of Air Liquide's sites are located in countries that, according to the World Resources Institute, will be under extremely high water stress in 2020. Today, this represents 6% of the annual water consumption of Air Liquide's industrial sites.

Air Liquide Large Industry production plants manage their fresh water supplies to minimise water usage by efficient water recycling and minimal non-polluting water discharge, returning it to the original source or to an authorised municipal or client treatment plant. Water consumption is typically through evaporation for process cooling and steam generation or as a raw material for production of hydrogen. Where appropriate the required process cooling may be achieved using closed cooling circuits which do not consume water at all, or in coastal regions by sea water cooling.

A team of some 70 Water Technology Experts, located worldwide, support local operations to care for water.

	2013	2014	2015	2016 ^(b)	2017
Annual water consumption (estimation in millions of m ³)	68	70	79	77	81 ^{*(a)}

* Indicator verified by the independent verifier.

(a) Represents less than 0.5 one-thousandth of the industrial water consumption of the economies under review.

(b) Excluding Airgas.

1.3. Summary of greenhouse gas emissions

In 2017, Air Liquide's CO₂ emissions totaled 26.2 Mt of CO₂-eq.^(a), broken down into:

- 11.7 Mt of indirect emissions^(b), 94% of which were due to the operation of air gas separation units (ASU);
- 5.1 Mt of emissions from cogeneration units;
- 8.6 Mt of CO₂ from hydrogen production units (HyCO);
- 0.7 Mt of CO₂ from the transportation of gases;
- 0.1 Mt of CO₂-eq. from other Group activities.

1.4. Emissions avoided and other positive contributions

Air Liquide's products and operational efficiency enabled the Group to avoid 16.1 Mt of CO₂ emissions, broken down into:

- 11.5 Mt of CO₂ at customers' premises, through the use of oxygen produced by the ASUs^(c);
- 4.6 Mt of CO₂ due to the Group's operational efficiency compared with in-house production by customers^(d).

Moreover, 3.5 Mt of CO₂ was purified and supplied to customers by Air Liquide in 2017 to be used in various applications including greenhouses and the food industry.

Finally, the majority of hydrogen produced is used to desulfurize fuels and thus helps avoid 1.5 Mt of SO_x emissions.

1.5. Biodiversity

The impact of Air Liquide's activities on biodiversity is limited because the Group's production units are generally located on small sites in industrial zones.

However, Air Liquide supports biodiversity preservation via its Foundation, which funds micro-initiatives around the world on environment-related local development, and scientific research projects in the field of environmental protection, focusing on projects that contribute to the preservation of our planet's atmosphere.

In recent years, the Foundation has sponsored the following:

- the Under The Pole expeditions to Greenland and to the archipelagos of French Polynesia. By supporting these environmental research programs, the Foundation contributes to the protection of biodiversity;
- the work of the Institut de Recherche pour le Développement (IRD) and WWF France respectively on mangroves in the Indo-Pacific region and the Gabonese forests. These works aim at quantifying and qualifying the carbon cycle of mangroves and forests with an objective: protecting these ecosystems which are the home to a wide range of biodiversity;
- the Observatoire Français d'Apidologie's (OFA) project aims at increasing bee populations in Europe. The OFA is carrying out a study on the selection of bees capable of resisting a parasite called varroa which attacks certain types of bees. The decline in bee populations is a major threat to biodiversity and agricultural production. The aim of the OFA's project is to develop a natural and non-chemical solution that can sustainably be used to fight against this parasite.

(a) CO₂-equivalent.

(b) Emissions linked to electricity production and steam purchased.

(c) Details page 82.

(d) Details page 85.

2. Solutions for clean transport



Global warming and air pollution make the transition towards new modes of transport necessary. The mobility of people and goods account for the emission of around 7.5 GtCO₂ per year. In response to this challenge, Air Liquide provides efficient solutions which will help reduce the carbon footprint of transport.

Converting 10% of transportation to low-carbon or carbon-free hydrogen would help avoid annual emissions of 750Mt of CO₂-equivalent and significantly improve air quality.



Hydrogen, a molecule for energy transition

Hydrogen is a high potential energy vector that is clean and safe. It can be used in order to produce energy or as a raw material in the industry and can easily be stored on a large scale.

This gas can be produced from electricity (renewable) or from low carbon emission fossil fuels and its use generates zero emissions. Multiple uses are possible because it can be stored and transported at high energy density in liquid or gas and recovered or used in fuel cells to generate heat and electricity. This versatility provides hydrogen with an essential role in the area of transportation, but also in the residential and industrial sectors as well as for large scale storage of renewable energies: a promising solution to meet energy transition challenges.

2.1. Hydrogen

Hydrogen has serious potential to meet the challenges of clean transport: reducing greenhouse gas emissions, urban pollution through particles and noise, and dependency on oil-based fuels. Air Liquide is a committed player in the hydrogen energy sector thanks to its expertise and management of the entire chain: production, storage, distribution and use by the end customer. For example, the Group is part of the Hydrogen Council, a global initiative which brings together energy, transport and industry leaders, for which one of its aims is to highlight that hydrogen is one of the key solutions in the energy transition. In this respect, the Hydrogen Council aims to:

- intensify investments in the development and marketing of hydrogen and fuel cells;
- encourage decision-makers to increase their support for the role of hydrogen in the future energy mix, in particular through public policies and relevant programs.

For further information, please refer to page 108.

Hydrogen-powered cars produce their own electricity “on board” through a fuel cell powered by hydrogen. In addition to enjoying similar performance characteristics as a classic car, hydrogen-powered vehicles are also silent and only discharge water. They are very efficient over long distances which currently represent 75% of CO₂ emissions in the transport sector.

One hydrogen recharge, which takes less than 5 minutes, already provides cars currently on the market with a range of more than 500 kilometers.

In addition to the passenger vehicle market, Air Liquide also provides charging stations for buses, in particular in Norway.

In Europe, Canada and the United States, several programs to develop and market hydrogen fuel cells for forklift have already been launched.

H₂

The development of the network of hydrogen charging stations in Japan

Air Liquide has joined a consortium of 11 Japanese companies to develop hydrogen in Japan. The aim is to create 160 hydrogen charging stations to charge 40,000 vehicles across the country by 2020. Air Liquide has already built six stations on the archipelago. This alliance of companies should be formed during spring 2018.

A growing network

Air Liquide participates to the development of hydrogen distribution infrastructures in Germany (400 stations by 2023 through the H₂ Mobility initiative), France (100 stations by 2022 and 600 by 2030 according to the Mobilité Hydrogène France plan), Japan, North East Europe and the United States. To date, Air Liquide has already developed and installed almost 100 hydrogen stations worldwide.

Air Liquide thus contributes, alongside automobile makers and public authorities, to the development of hydrogen energy.

HYPE: hydrogen taxis in Paris

STEP (Société du Taxi Electrique Parisien), which has Air Liquide among its shareholders, is deploying its fleet of hydrogen-powered electric taxis in Paris and currently has almost 75 taxis on the capital's roads.

These taxis refuel at two hydrogen charging stations that Air Liquide developed and installed, one in central Paris and the other at Orly airport.

2.2. Biomethane

Recovery of biogas

Air Liquide promotes several initiatives which follow the circular economy model, such as the recovery of biogas. In cooperation with various partners, Air Liquide recovers waste products by transforming them into biogas using a methanization process. This biogas is then injected into the natural gas pipeline system or distributed to end customers with biomethane stations or clean multi-energy stations. The end customer is often the producer of the waste products and therefore completes the loop of the circular economy.

In 2017, Air Liquide continued to invest in Scandinavia, an advanced market in this field, by acquiring a majority stake in Norwegian company Skagerak Naturgass SA, a subsidiary of Skagerak Energi which belongs to the Statkraft Group, the leading European producer of renewable energies.

Air Liquide continues to support the growth of this offering with the opening in 2018 of new hydrogen charging stations in the Paris region, in particular near Versailles and at Paris-Charles de Gaulle airport.

Blue Hydrogen, an Air Liquide initiative

Blue Hydrogen® is an Air Liquide initiative that aims to gradually lower the carbon content of Air Liquide's hydrogen production dedicated to energy applications. Concretely, Air Liquide is committed to achieving at least 50% of low carbon^(a) hydrogen necessary for these applications by 2020, by combining:

- the use of low carbon energies, water electrolysis and reforming of biogas;
- carbon capture and valorization technologies for the CO₂ emitted during the production of hydrogen from natural gas.



Transition to low-emission transport in Home Healthcare

Hydrogen-powered electric utility vehicles were recently added to the car fleet of VitalAire, an Air Liquide subsidiary in Home Healthcare. These vehicles have a range of 150 kilometers in hydrogen, that can be doubled through the electrical recharge of their batteries. They meet VitalAire's autonomy needs in the Île-de-France region. The technicians who drive these vehicles are impressed by the quality of their driving experience, their comfort and their silence. With the opening of new hydrogen charging stations in the Île-de-France region, VitalAire intends to continue with this initiative. They will purchase several hydrogen-powered electric utility vehicles between now and summer 2018.

The biomethane recovered by Air Liquide is mainly used as fuel, and is therefore called Bio-Natural Gas for Vehicles (Bio-NGV). This Bio-NGV comes in two forms:

- CNG (Compressed Natural Gas), a fuel which is used in stations for light-duty vehicles that are part of a captive fleet, cars, trucks, vans, buses;
- LNG (Liquefied Natural Gas), which is easy and safe to transport, and is used in stations for trucks and buses.

Biomethane is also used in the production of carbon-free hydrogen for clean mobility as part of Air Liquide's "Blue Hydrogen" commitment.

(a) According to definitions recognized by third parties, for example the work of the CertifHy project at the European level.



Hitting the road with less polluting and quieter trucks!

In 2017, with its partners in the logistics chain, Air Liquide set itself a target of transitioning a large share of its 1,700 trucks in Europe to cleaner and quieter solutions to reduce the emissions of pollutants and particulate matter. Addressing the air quality challenge, in particular in towns and cities, requires national or European infrastructures and the mobilization of several partners. The first Liquefied Natural Gas (LNG) trucks are already on the roads in Spain. The Group's commitment to clean mobility, its expertise and territorial presence has allowed Air Liquide to become a committed player in the energy transition.

2.3. Multi-energy stations

Air Liquide operates more than 60 bio-NGV stations in Europe as well as eight multi-energy stations which supply:

- bio-NGV to vehicles and;
- liquid nitrogen for refrigerated trucks with cryogenic air conditioning.

These trucks are equipped with the blueeze™ cryo-cooling solution, are silent, require no combustion motors and do not emit greenhouse gases through their refrigeration units. Moreover, the drop in temperature is twice as fast as traditional technologies.



Cryocity™, an innovative refrigerated unit prototype for last-mile logistics

Air Liquide, in partnership with Petit Forestier, a specialist in refrigerated transport and Comptoir du Frais, a fresh produce retailer for non-domestic catering, is currently testing the Cryocity™ prototype, an onboard refrigerated unit specially designed for light utility vehicles.

Cryocity™ is autonomous, clean and silent. Its patented technology is based on the use of dry ice, a powerful source of cold that can keep produce cold for the duration of the delivery route. Dry ice is instantly produced from a liquid CO₂ source that is transformed in an exchanger tank in the truck designed to optimize its load capacity.

The Cryocity™ unit is entirely independent from the vehicle's engine which allows for silent deliveries day and night and contributes to reducing pollutants emitted by delivery vehicles. Its carbon footprint is 75% lower than systems powered by fossil fuels. With Cryocity™, Air Liquide is testing a new technology which will complement its range of cryogenic solutions for transport at managed temperatures.

2.4. Improve air quality

2.4.1. THE DESULFURIZATION OF OIL-BASED FUELS THROUGH HYDROGEN

Sulfur oxides released in the atmosphere cause serious respiratory difficulties. They are also responsible for smog and acid rain that leads to deforestation and the acidification of water.

Hydrogen is mainly used in refineries in order to desulfurize fuels and as a result to contribute to cleaner transportation. The use of these fuels almost no longer generates sulfur oxide emissions, one of the main atmospheric pollutants. In 2017, the hydrogen supplied by Air Liquide to its customers' refineries resulted in the avoidance of 1.5 million tons of sulfur oxide emissions being discharged into the atmosphere, which is more than ten times as much as the total sulfur oxide emissions of a country like France.

Overall, CO₂ emissions from the desulfurization of fuels by industrial gases companies like Air Liquide are only around 30 million tons, where emissions from the combustion of fuels for transportation stand at 7.5 billion tons.

In 2017, Air Liquide signed a new contract with a subsidiary of national oil and gas company Petróleos Mexicanos (PEMEX) for the hydrogen supply of the PEMEX refinery located in Tula de Allende in central Mexico. With an investment of 50 million euros for the acquisition and optimization of an existing hydrogen production unit, Air Liquide could supply 90,000 Nm³ of hydrogen per hour to PEMEX.

2.4.2. INNOVATE TO IMPROVE AIR QUALITY

Purify indoor air

To expand its portfolio of solutions aimed at improving air quality, Air Liquide has developed and launched an indoor air purification pilot project. This procedure is based on a gas purification technology that the Group has mastered for a long time: adsorption. With this procedure, a solid material captures certain gas molecules for better air quality.

This system was installed in May 2017 in the Lyon area of France, in a building which served as a pilot site and where Air Liquide, among other companies, is present. The aim is to roll out the offer to commercial premises, universities, shopping malls and industrial customers.

AIRLAB: step up innovation for air quality

In large metropolitan areas such as Paris, air quality is a major challenge: many citizens remain exposed to pollution levels which exceed the World Health Organisation's recommendations. AIRLAB is the first innovation accelerator for air quality in France. This initiative was launched in 2017 during the national air quality day of Airparif and its partners, including Air Liquide. This event brings together a community of major companies, SMEs and start-ups, research institutions, local authorities and citizens. Everyone contributes ideas, expertise, and means to improve air quality.

AIRLAB aims to encourage the development and implementation of new solutions in Paris and the Ile-de-France region and their enhancement at the national and international level.

For further information on Air Liquide's innovation projects: see the Innovation chapter on page 58.

3. Measures to promote local development



Air Liquide's local presence

Air Liquide's teams across the globe are wholeheartedly committed to playing their part in the local economic life. This participation includes hiring employees in the area and developing close relations with training organizations and universities that can prepare people for the Group's core businesses.

Air Liquide supplies more than two million industrial customers, major companies, SMEs, craftsmen, and others thanks to the large diversity of its industrial gas applications. The Group provides solutions which are adapted to the competitive or innovative needs of each customer and supports them in their development. In healthcare, Air Liquide is present in the development of infrastructures by supplying medical gases and dedicated equipment to hospitals and by training their staff in their use. The Home Healthcare activity, where Air Liquide cares for more than

1.5 million patients with chronic diseases, is an exceptional outreach activity, with a very strong human dimension. Air Liquide employees regularly visit each patient in their homes, provide advice to them and their relatives on their treatment, discuss with their doctor, all in the aim of helping each patient live with his or her condition as best as possible.

In addition, the Group's activities, as well as the means implemented in order to prevent and manage industrial risks, are regularly presented to the populations near Air Liquide's sites. In France, the industrial sites participate in two local committees, CLICs and CLIEs. These committees provide information and regulatory consultations at the communes' initiative, with the aim of providing transparent information on their activities to representatives of the local populations.

3.1. Extend access to care: the Access Oxygen offer

In 2017, Air Liquide launched the "Access Oxygen" project in Senegal, aimed at providing medical oxygen to isolated areas. Due to major waiting times for hospital transfer, the lack of oxygen is particularly key in the event of a medical emergency, notably during childbirth, with sometimes fatal consequences.

Air Liquide's Access Oxygen is a full-service enabling small health structures to benefit from both the equipment and services needed to use oxygen therapy in the treatment of acute diseases. These structures offer first level access to healthcare for patients living in suburban and rural areas in developing economies.

This solution includes a fixed oxygen source, a mobile oxygen source and a pulse oximeter. The service also provides the maintenance of equipment and the training of medical staff. Access Oxygen is based on

a specific digital application designed for doctors and nurses in these small health structures. It is aimed at assisting them in making decisions as to whether an adult, child, or infant patient should be given emergency oxygen. The Access Oxygen application also enables them to create a patient record.

The first Oxygen House inaugurated in Thiès, Senegal is part of this offering and is used as an "oxygen base". This is where cylinders are filled and medical devices are stored and maintained. The head of Access Oxygen lives on site and the Oxygen House is also the training center for medical teams and technical center for local healthcare structures. The head of Access Oxygen is the unique contact person for health posts and health centers. He is responsible for the monitoring and maintenance of equipment and the safety and reliability of the offering.

3.2. The Group's commitment to communities

3.2.1. SUBSIDIARY INITIATIVES

In addition to the initiatives of the Air Liquide Foundation, subsidiaries are also directly involved with the communities throughout the world, supporting local corporate philanthropy initiatives. As well as financial support, these actions are successfully conducted with the enthusiastic involvement of employees.

Air Liquide Canada raised money to improve the quality of life of people affected by a serious illness. The contribution of the employees and subsidiaries of Air Liquide Canada and VitalAire Canada totaled 100,672 dollars, i.e. almost 70,000 euros. The amount was donated to PartenaireSanté and its 16 charities.

In China, Air Liquide organized a tree-planting day, an IT equipment donation scheme and conferences to raise awareness about road safety. Moreover, Air Liquide offered first aid training to 40 employees for the second year in a row. Certified employees volunteered to be first aiders at more than 20 sporting events, including the Shanghai marathon on November 12, 2017, totaling more than 490 hours of voluntary work.

Air Liquide Brazil supported 10 projects in 2017 with funding of more than 250,000 euros. The subsidiary in particular supported 300 theatrical performances of 5-15 minutes each in hospitals: a humorous approach

to improve the conditions of hospital stays and waits. The entity also contributed to a socio-educational project aimed at preventing juvenile delinquency and drug dealing which included technical football training and nutrition information.



The welding study program in Philadelphia

Since 2012, Airgas has set up a partnership with the A. Phillip Randolph technical high school in Philadelphia to address the shortage of qualified welders seen over recent decades and offer a career path to students who may come from disadvantaged backgrounds. In 1988, there were 570,000 welders in the United States but by 2012 there were less than 360,000. The American Welding Society forecasts that the welding profession will be short of 290,000 qualified experts by 2020.

Airgas provides financial support and donates equipment to the technical high school's welding program. Airgas has also established a mentoring program with employees and high schoolers during which welding site visits are organized. Currently, 58 students between the ages of 15 and 17 are part of this program.

3.2.2. SUPPORT FROM THE FOUNDATION, IN PARTNERSHIP WITH OUR EMPLOYEES

In the framework of its local micro-initiatives support program, the Foundation favors actions aimed at developing local communities over the long term in countries in which the Air Liquide Group operates.

In 2017, the Foundation supported projects in the fields of education and training, access to care, disability, social welfare and access to water and energy.

The Foundation is supported in its work by Air Liquide employees who sponsor local development micro-initiatives. It provides employees the opportunity to take part in community work and to express their social and human commitment. The role of a sponsor is broken down into three steps:

- making contact and feasibility study: the sponsor visits the project site. The sponsor checks that the micro-initiative meets the Foundation's selection criteria and is eligible to receive its support;
- follow-up and support: the sponsor visits a project supported by the Foundation at its mid-way point and prepares a project advancement report with the project initiator;
- final evaluation: when the project is completed, the sponsor visits the site of the initiative to compile a report on the implementation of the project.

Moreover, Group employees are also encouraged to recommend projects in organizations close to their hearts.

3.3. Develop the local economy

The total amount of Group procurement in 2017 was 11 billion euros, including energy and transportation procurement.

Subcontracting

In 2017, subcontracting for Air Liquide came to a total of 1.7 billion euros. Subcontracted activities are mainly those which are too far-removed from the Group's activities or that require specific resources or that are linked to a concentrated workload at particular times.

Since 2008, Air Liquide has published the number of lost-time accidents of its subcontractors and temporary workers. In 2017, there were 90 lost-time accidents of this type recorded.

Currently, 345 employees are involved in the Foundation's actions.

Focus on education and training

Education and training play a predominant role in the Foundation's Local Development mission and represent more than 30% of the micro-initiatives supported since its creation in 2008. In 2017, ten projects were supported across four continents: the fight against school drop-out in Canada and French Guiana, training courses for careers in digital technology in the Philippines and in tradesmanship in Morocco, fields which encourage the economic growth of communities.



Shareholders represented in the selection of projects

Air Liquide shareholders also contribute to the Foundation's missions. A shareholder is also a member of the Project Selection Committee. The representation of shareholders in this way is a special feature of the Air Liquide Foundation. Their presence is important: the shareholder provides an external perspective, while being familiar with the Group. The other seven members of the Project Selection Committee are Group employees. The Project Selection Committee examines the projects put forward by the Foundation's team three times a year.

Local procurement

More than 80% of Air Liquide's procurement expenditures are made locally, limiting the environmental footprint relating to transportation and developing the local economy. As an example in this area, Air Liquide is a partner and member of the Board of Directors of "Pacte PME", an association which puts innovative small and medium-sized enterprises (SMEs) in contact with major French groups. In 2016, of the 55 public and private corporate accounts, the association gave Air Liquide the best score for its exemplary approach to the development of collaborative working relationships with SMEs. One of the Group Procurement initiatives involves the launch of a physical network for the coordination and consolidation of the work done in France by the Air Liquide's Procurement teams. This approach rallies the Group's Procurement teams around a central objective: the creation of value through the development of collaborative working relationships with our ecosystem of suppliers (open innovation platform, sharing of expertise, best practices in terms of intellectual property, etc.) which contribute to the growth of French SMEs.

> DIALOG WITH STAKEHOLDERS

1. The Air Liquide Foundation's initiatives in favor of local communities

Created in 2008, the Air Liquide Foundation represents the Group's commitment to being a responsible enterprise. With a budget of almost 3 million euros over five years, the Air Liquide Foundation provides financial, material and Human Resources means to the projects which it supports in the countries where the Group is present.

The Air Liquide Foundation's action is in line with the Group's Corporate Sustainability Program which aims to improve air quality and is committed to the stakeholders of the Group. In this context, it has set itself the following three missions:

- environment: support scientific research projects in the environmental protection field that contribute to preserving our planet's atmosphere;

- health/breathing: support scientific research projects aimed at improving respiratory function and gas metabolism in the human body in the healthcare field or exploration fields (space, deep-sea diving, sport);
- local development: support local development micro-initiatives which contribute to improving living conditions in communities in the following fields: access to water, energy and care, education and training, the environment, disability, micro-entrepreneurs, social.

How the project selection at the Air Liquide Foundation works

Project Selection Committee (PSC)



EXAMINE
projects preselected by the Foundation's team



SELECT



ASSESS

Composed of :

- the Foundation's team
- employees from Research, Healthcare, Operations, Finance, Communication Departments
- the representative of the Shareholders' Communication Committee
- the Foundation's Executive Officer

Meets **3 times** a year



Board of Directors (BoD)



DEFINE
corporate philanthropy focuses



VALIDATE
research projects selected by the Project Selection Committee







Composed of:

- the Chairman of the Foundation
- Directors: Founders, personnel representative, qualified external experts
- the Executive Officer who is secretary of the BoD, a representative of Legal Affairs

Meets **twice** a year




EXAMPLES OF PROJECTS IN 2017

<p>INADES-Formation</p>  <p>Togo</p> <p>Solar energy for the organization of social micro-financing</p>  <p>Energy access</p>	<p>Life Project 4 Youth</p>  <p>India</p> <p>Youth professional training via the creation of an economic micro-activity</p>  <p>Education & Training</p>	<p>Ciudad del Nino Foundation</p>  <p>Chili</p> <p>Creation of a center for young victims of abuse</p>  <p>Social</p>
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EXAMPLES OF PROJECTS IN 2017

WHY Expéditions



France

The role of coral reefs in climate regulation



Scientific environmental research

Foundation's projects approved in 2017 were located in 20 countries, including one new country, Chile:

- an environmental research project;
- three health/breathing research projects;
- 26 local development micro-initiatives.

The Air Liquide Foundation has supported 284 projects, including 248 local development micro-initiatives and 36 environment and health/breathing scientific research projects in around 50 countries since its creation.

A dedicated Air Liquide Foundation website enables projects to be directly submitted online, in French or English. The website address is: www.fondationairliquide.com/en.

2. The long-term commitment of employees

Air Liquide brings together 65,200 men and women of more than 150 nationalities, in 80 countries, who form multi-cultural teams with a host of skills. Air Liquide strives to promote this diversity, encourage innovation and the commitment of employees, to meet customers' expectations and guarantee the Group's long-term performance.

As part of the NEOS 2016-2020 company program, Air Liquide's Human Resources has set an objective of valorizing individual and collective performance, while promoting new ways of working that are more collaborative and digital through a network-based structure. The development, recruitment and commitment of employees in a constantly changing world are the main priorities of Human Resources.

Employees' voices - commitment surveys

The commitment and motivation of employees is one of Human Resources' priorities. Commitment surveys are carried out in the various Group entities to give employees the opportunity to voice their views. Against this backdrop and in order to guarantee confidentiality and the sincerity of results, the surveys are carried out by external companies.

Over the past three years, commitment surveys were sent to 63% of Group employees, excluding Airgas^(a).

2.1. Develop talent

Training

Air Liquide takes particular care to develop the competencies and expertise of its employees. The Group enables its employees to improve their performance, their contribution and their employability. In 2017, excluding Airgas, the percentage of Group's employees who had at least one training session during the year is increasing at 73%^(b).

University for all!

Through its Corporate University, Air Liquide develops its training programs to meet the needs of employees while incorporating the Group's values. The University has a dual objective:

- formalizing and rolling out the training processes and disseminating good practices that go hand in hand with the Group's training dynamic;

Participation of employees in the capital of L'Air Liquide S.A.

The Group wishes to continue increasing the involvement of its employees at the global level in its development by having its employees more broadly participate in the capital of L'Air Liquide S.A.

Thus, since 1986, 13 capital increase operations have been reserved especially for Group employees, so that they can take advantage of preferential conditions. These employees share ownership transactions contribute significantly to increasing employee motivation and their sense of belonging to the Group.

At the end of 2017, the share of capital held by the Group's current and former employees was estimated at 2.2%, of which 1.5% (within the meaning of article L. 225-102 of the French Commercial Code (Code de commerce)) correspond to shares subscribed by employees during employee reserved capital increase operations or held through mutual funds.

- offering about 20 specific programs, ranging from integrating new employees to developing leadership abilities, as well as "professional" training programs given by the different business lines. The Group's values, Principles of action and key challenges are systematically included in the various modules.

Campuses are held by the University with the Human Resources teams of the various hubs. This allows us to roll out the training programs and helps employees build their network.

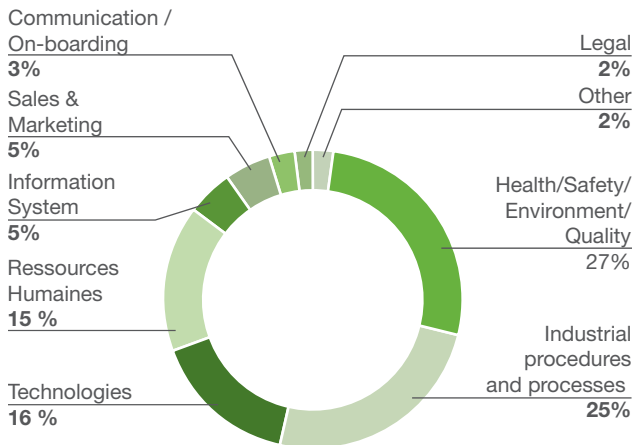
An e-learning platform provides employees with support for their training. It offers over 3,200 interactive training modules (in more than 22 languages). At end-2017, more than 170,000 e-learning training modules were followed, which represented a total of 54% of training carried out within the LMS, i.e. 30% more than in 2016.

(a) 45% including Airgas who didn't have the possibility yet to organize these commitment surveys.

(b) Training data for Airgas cannot be consolidated yet due to the recent integration of the entity.

The online training offer is upgraded every year and covers many topics such as safety, ethics, Human Resources processes, management and, more recently, digital technology.

BREAKDOWN OF TRAINING TOPICS (a)



(a) Excluding Airgas – This breakdown includes almost all Group entities in which the Learning Management System has been rolled out.

Employee performance reviews

Employee performance is monitored and measured during performance review meetings that each employee has every year with his or her direct supervisor, but also during career development meetings that enable each employee to talk about more long-term prospects with the local Human Resources Department. The Group's Human Resources Department fosters these meetings as they are one of the cornerstones of the Company's Human Resources policy. In 2017, 81% of employees had a performance review meeting with their immediate supervisor.

Through many Air Liquide University programs, Air Liquide enhances a Feedback Culture within the Group. In different leadership or management programs of the University such as STRECH, LEAD, INSPIRE or GEAR UP, different tools are used to develop managers competencies around feedback.

For example, 360° feedback has been implemented in these programs for many years. The objective of this tool is to help managers to grow through a personal development plan based on the feedback received from one's own manager and direct reports. In this program, managers are trained on how to give and receive feedback in order to improve self-esteem thanks to an efficient communication.

Technical expertise recognition and enhancement

The Technical Community Leaders (TCL) program enables talent in the technical sectors to access careers that offer recognition, satisfaction and influence. More than 3,000 experts have been recognized, playing a key role in sharing expertise, knowledge and technical excellence.

In 2017, three International Fellows, 24 International Senior Experts and 52 International Experts from several regions of the world received recognition. This community of the Group's technology experts contributes to the transfer of the technical know-how that Air Liquide will need in the future. Experts are selected for their strong expertise in science and technology and their active contribution to innovation and knowledge transfer.

Each TCL expert contributes in the following four areas:

- communication & network: submit publications, grow networks, deliver audits and represent the Group externally;
- innovation & technology: lead their technological area, contribute to strategic decision-making, develop creative new ways of working and anticipate needs;
- business development: design solutions customer oriented, submit patents and identify new opportunities;
- transfer of knowledge: design and deliver training, mentor talent and peers, develop TCL locally and contribute to knowledge sharing.

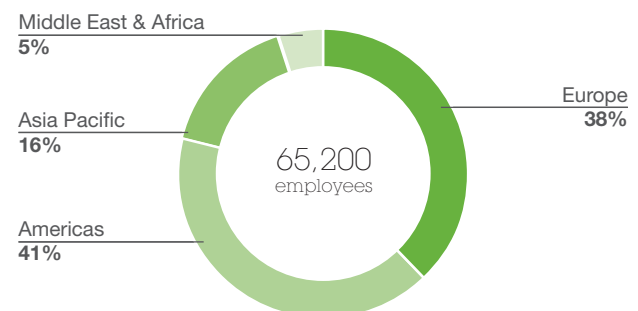
Internal mobility: a key element in career development

Mobility corresponds to an employee's ability and wish to change job or location, either within the same country or abroad, to meet the Company's needs and develop on a personal level.

Internal mobility, whether in terms of shifting job function or geography, is encouraged by the Group. This talent management practice not only promotes diversity within teams, but also opens a wide range of career opportunities for employees. Internal mobility also builds extremely strong and lasting networks within the Group.

The Group's presence in 80 countries gives employees the opportunity to develop themselves abroad.

BREAKDOWN OF GROUP EMPLOYEES BY GEOGRAPHIC REGION IN 2017



2.2. The choice of diversity

Diversity is a priority of Air Liquide's Human Resources policy and the Group considers it a source of dynamism, creativity and performance. It is a fundamental element of the organization, in terms of both business lines and employees, and drives the Group's long-term performance. A team within the Human Resources Department is responsible for managing

diversity projects. The five axes of the Group's Human Resources diversity policy are: nationality, gender, educational background, age and disability. Through this diversity policy, Air Liquide is strongly committed to fighting any form of discrimination.



Diversity jam session

A 48-hour jam session on diversity and inclusion was organized in 2017. Employees from all over the world shared their ideas, best practices and their success stories.

Air Liquide's various entities were actively involved: almost 1,200 participants and more than 5,000 posts, comments or likes on the Google+ "Valuing our differences" community. The entities organized more than 100 local events, which enriched online discussions and highlighted the diversity and creativity of Air Liquide's teams. Moreover, employees were able to follow Air Liquide managers' presentations through live video conferences.

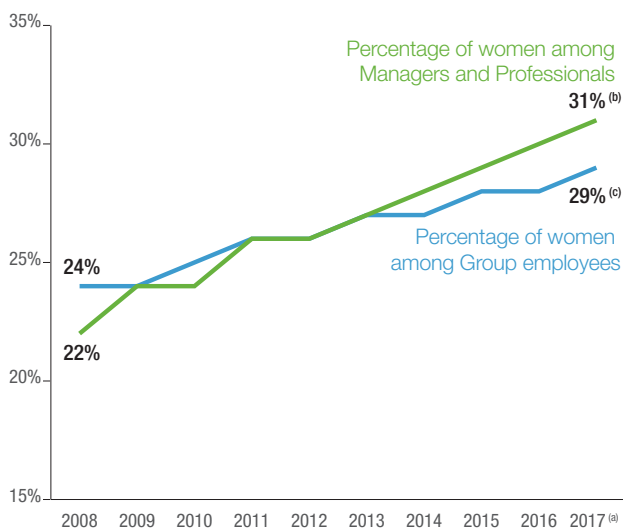
Nationality

Air Liquide's senior managers are of 33 different nationalities. The Group's Board of Directors is composed of six different nationalities. In terms of total employees, more than 150 different nationalities are employed by the Group.

Gender

Equality between men and women is an essential point in the expression of this diversity. The percentage of women increases each year, in particular among managers and professionals, which now exceeds the percentage of women in the Group. Women now represent 40% of employees considered as high potential. Five women are now members of the Group's Board of Directors and two women are members of the Group Executive Committee.

PERCENTAGE OF WOMEN AMONG MANAGERS AND PROFESSIONALS AND PROFESSIONALS



(a) Excluding Airgas.
(b) 29% including Airgas.
(c) 26% including Airgas.

These results are the fruit of a concrete, global Human Resources strategy based on the following four priorities:

- **Recruiting to strengthen the place of women in the Group, in particular through hiring managers and professionals.**
- **Developing careers and increasing responsibilities for women in the Company:**
 - for every management position that becomes available, Human Resources examines the application of at least one woman among the applicants;
 - a meeting before and after maternity leave has been organized in a certain number of entities.
- **Involving all the managers.**
- **Better balancing of professional and private life.**

In the framework of Air Liquide's policy on promoting equality, the hiring and career development of women and strengthening their place and responsibilities in the Company, a program on awareness-raising and discussions on the benefits that equality brings was organized in the Group, aimed at managers.

The Diversity Charter in France that Air Liquide signed in 2009 is available online and is an illustration of the Group's commitment to diversity. Within the Air Liquide management training program called GEAR UP, one session is dedicated to the theme of diversity and the value of differences. More than 8,000 managers worldwide have already received this training.

Each year, Air Liquide joins forces with International Women's Day, celebrated on March 8. This is also when Air Liquide takes part in the annual InterElles seminar. The Cercle InterElles brings together the networks of 14 technology companies which are focused on promoting gender equality and equal opportunities. The Cercle InterElles network has stood out in recent years as a pioneer in the battle against stereotyping and as a supporter of gender equality in companies and of equal opportunities.

Educational background

Air Liquide is continually looking to recruit different profiles to build multi-disciplinary and complementary teams.

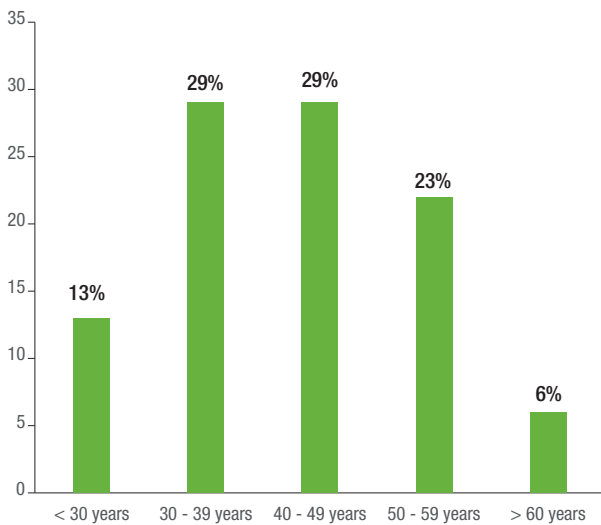
The Group's diversity is characterized by the fact that there is no "standard career path". Quite the contrary, each employee adapts his or her career path according to their individual objectives and the career opportunities offered by the Group. Internal mobility and technical expertise are two major factors in career development.

Age

The Group has invested in better professional qualifications and training programs for young people to facilitate their integration into the business world. As a result, in France, almost 527 young people have benefited from work-study contracts and around 415 from an internship, combining theoretical learning in their university or school and a practical internship at Air Liquide.

Seniors will represent an increasing share of Air Liquide employees in the coming years. Their contribution to mentoring and training programs aimed at younger generations will be further promoted.

DISTRIBUTION OF EMPLOYEES BY AGE BRACKET IN 2017



Disability

As is the case for other diversity cornerstones, disability can be a factor of openness, innovation, unity and performance. That is why Air Liquide is committed to making the integration of employees with disabilities commonplace within the Company.

"Our differences are our strength" is the Group's disability policy slogan. This slogan is the main driver of the actions in favor of the inclusion of disabilities today and in the future.

In France, thanks to the actions and involvement of a network of players, a set of subsidiaries has seen an increase in the rate of employees with a disability over the past decade, from 1.75% in 2007 to 4.4% in 2017.

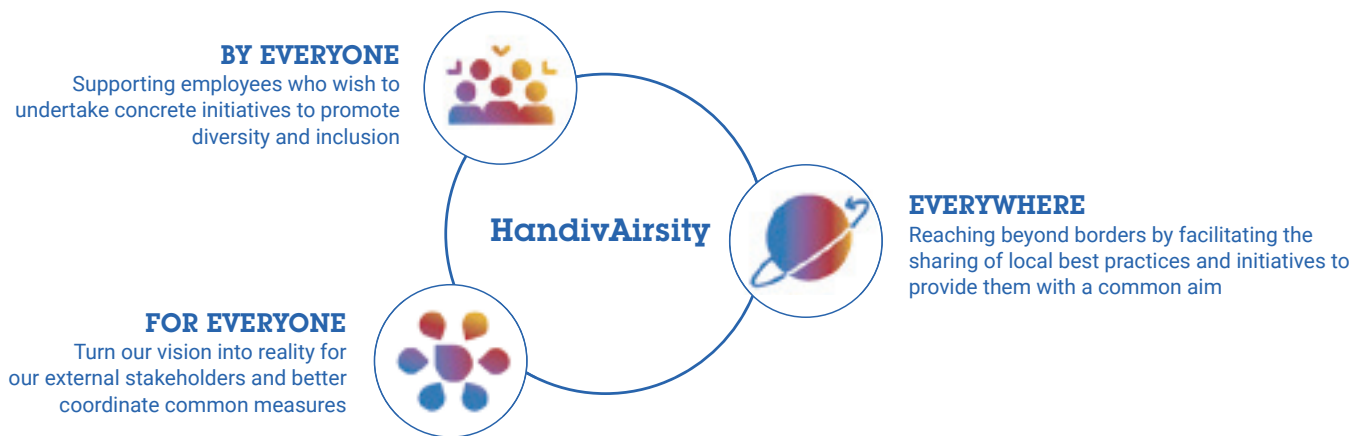
Air Liquide enables employees with a disability to be fully integrated and maintained in their jobs thanks to:

- the application of a company agreement in favor of job entry for disabled workers, approved by the DIRECCTE departmental unit;
- the employment of people with a disability;
- the signing of contracts with companies in the adapted sector and the protected sector;
- welcoming disabled persons on internships who benefit from a right to professional training,

In 2017, to coincide with the 10-year anniversary of Mission Handicap in France and drawing on the momentum of transformation driven by the NEOS company program, the Group reviewed the organization of its Disability policy and added an additional dimension.

Mission Handicap therefore becomes HandivAirsity; an initiative which involves a whole ecosystem of players on an European scale such as employees, shareholders, customers, and suppliers and provides the means to commit to working together to promote diversity and the inclusion of disability.

HandivAirsity is the driving force behind the change desired: "by everyone, everywhere, for everyone".



This new initiative underlines the Group's commitment to becoming a well-known and recognized player by valuing the uniqueness of each person for the benefit of all.

A Charter has been drawn up to provide clear guidelines for the desired change and to drive the new momentum for the inclusion of disability internally.

The project was officially launched on November 16 during European Disabled Workers Week and was attended by more than 400 participants either in person or remotely.

Actions encouraged by the Group can take many forms:

- the recruitment and integration of employees with a disability, interns or work-study placements for all positions;
- job security and career development for employees with a disability;
- training;
- informing and raising awareness among all employees;

2.3. New ways of working

Today's trends encourage companies to adapt rapidly to their external environment by responding to changes in the world of work which include digital transformation, collaboration and performance.

A new organizational structure

To meet these challenges and encourage efficient decision-making, Air Liquide has introduced a more decentralized organizational structure which relies on its hubs and Clusters (groups of countries or entities). This global scale network structure is more agile, favors initiative-taking and strengthens proximity with customers.

- the development of subcontracting to firms in the adapted and protected sector ^(a);
- involvement and support of the development of external voluntary initiatives, in particular through the Air Liquide Foundation;

For example, in terms of training, an e-learning module was developed with a start-up specialized in learning methods and raising awareness regarding diversity to encourage employees to support more initiatives in favor of inclusion.

The Air Liquide Foundation takes part in Group measures to promote the inclusion of people with disabilities. It supports disability-related projects as part of its Local Development mission. In 2017, seven initiatives in France, Romania, China, Tunisia and Singapore were supported, including projects supporting mobility, access to news and culture for the deaf and hard of hearing, as well as projects that support the personal development of children and adults with disabilities. Since its creation in 2008, the Foundation has supported 42 disability-related projects in eight countries which represents 17% of projects supported by the Foundation.

Kite: a collaborative workplace

A collaborative workplace called "Kite" was launched Group-wide in 2014. Kite is changing every year to offer new services to its users. To assist users, Kite Champions within each team provide local support. In March 2017, the 100% Kite week was organized to adjust employees' ways of working: success stories and experience were shared. Training sessions were organized throughout the week, as well as workshops, demonstrations and a challenge for employees.

To support the Group's Digital Transformation, Air Liquide University has launched a training course which leads to the award of a digital passport. This consists of several self-assessment questionnaires on digital culture in general, but also on the knowledge of Kite.

(a) Sector of economic activity giving priority to employing workers with disabilities.

Google+ communities

Networking and collective intelligence drive innovation and entrepreneurship. The Group therefore provides employees with the opportunity to create and access Google+ communities through the Kite collaborative workplace. The communities get employees involved in various subjects – expertise, tools, events, processes, shared interests, etc. – but they are all based on the same desire to share information and best practices. They transform ways of working, placing an emphasis on agility, efficiency, diversity and collective intelligence.

To get employees involved in diversity and inclusion measures, a community called “Valuing our differences” exists and helped organize the Jam dedicated to this subject.

2.4. Working conditions

Remuneration

The comprehensive remuneration of Group employees is based on three criteria:

- the position held;
- the degree of responsibility;
- performance.

Plus the factoring in of the situation of the local market, the Group’s fair pay at hiring policy and current legislation. It is generally made up of a basic salary plus additional remuneration elements.

The variable portion of remuneration is devised locally for certain categories of employees to reward performance. In general, it depends on parameters such as the Group’s earnings, the entity’s earnings and individual performance, which is measured in quantitative and qualitative terms. By rewarding collective and individual performance, Air Liquide encourages everyone to collaborate and contribute to overall earnings. In 2017, 57% of employees received an individual variable portion as part of their remuneration (66% excluding Airgas, up 5% compared to 2016). Most of the managers and professionals have a variable remuneration, which includes sustainable development objectives. 15% of managers’ variable remuneration is linked to sustainable development criteria, such as safety, customer satisfaction, energy efficiency and equality.

Finally, the top 370 Group executives have a significant portion of their variable remuneration mandatorily linked to these criteria, safety for example, but also Corporate Sustainability Program targets for their entity.

Remuneration may also include benefits such as disability-incapacity-death insurance, health insurance, profit sharing^(a) or solutions to help balance work and family life which vary by country (for example, childcare places).

In 2017, almost 100% of employees benefited from some sort of social security coverage through the Group, in particular in terms of pension plans.

(a) This method of remuneration, used in certain countries, is at the Company’s initiative or in response to local legislation or market requirements.

Digital solutions and Human Resources management

G+ communities dedicated to Human Resources exist and allow teams to share their best practices and raise awareness of the Group’s Human Resource’s policy.

The “MyTalent Online” platform harmonizes Human Resources processes within the Group. It is accessible to all employees and covers, in the same personalized area, internal and external mobility offers, talent management and the training platform.

Well-being

The official definition of well-being in the workplace provided by the World Health Organization (WHO) considers well-being in the workplace to be “a dynamic state of mind characterized by reasonable harmony between a person’s abilities, needs and expectations, and environmental demands and opportunities”. Moreover, in 2015, the 193 UN Member States set 17 Sustainable Development Goals (SDGs) for 2030. Almost all of these goals have a health component or contribute to improving global health. One of these Sustainable Development Goals is specifically focused on health and well-being. It aims to “ensure healthy lives and promote well-being for all at any age”.

The quality of life in the workplace may also have a direct impact on the motivation of employees and their productivity. In order to strengthen occupational well-being within Air Liquide, various initiatives were implemented in France to promote the personal/professional life balance of its employees:

- an e-portal enabling employees to access practical, administrative and legal information to facilitate daily life. It can be used by the employee and his or her family via a personal access code. Over 50% of the Group’s employees in France now have access to this e-portal;
- a telephone service enables employees to call, from their office or home, specialists (for example, doctors, legal specialists, social workers, guidance counselors, etc.) who answer their questions with complete confidentiality on areas as varied as the family, housing, well-being and healthcare, unforeseen events, budget management, taxation and retirement. Air Liquide is a forerunner in this area as the Group is currently one of the few in France to offer its employees such a large range of services;
- nursery places in inter-company crèches are offered to employees of subsidiaries covered by this partnership. At the end of 2017, 51 places had already been financed by Air Liquide for its employees;

- the CESU (Universal Service Employment Check), whose aim inter alia is to facilitate childcare in the home, has been implemented for certain entities in France for Group employees who have young children;
- in November 2017, workshops were offered to employees at the head office in Paris to discover, learn and experiment with what could help to improve their well-being and in particular in terms of employees rights to logout and disconnect from work. These workshops promoted better use of digital tools, and were run by external consultants.

Social dialog

In accordance with its Principles of action, Air Liquide is particularly committed to respect the highest standards in ethics and safety. The Group ensures that social dialog is encouraged and in this context, an increasing number of Air Liquide's employees (85% in 2017) have access to a representation, dialog or consultation structure.

In Europe, the European Works Council has 29 employee representatives from 13 countries. It was renewed in 2017 for a term of four years. The role and nature of exchanges within this body was strengthened by an agreement signed in 2014. Chaired by a member of the Executive Committee, the European Works Council met three times in 2017, for two ordinary and one extraordinary meeting. Two other meetings of the Council's presiding officers also took place. The main themes dealt with during information and consultation meetings are safety, the news on the Group's activities, especially in Europe, the annual financial statements, the Sustainable Development policy, strategy and its implementation in the different countries of Air Liquide's operations. The following subjects were discussed this year: the disposal of welding activities, commitment surveys, news on the NEOS company program in Europe, the digital and collaborative policy, customer relations, procurement in Europe, the activities of the World Business Lines.

In 2017 in France, several agreements were signed with the unions in key areas.

In terms of employee savings plans, new contribution and supplementary incentive payment agreements were signed with Group companies. In addition, all optional profit-sharing agreements were renewed for the 2017-2019 period which allow employees to be more involved in the Company's performance. In France, 96% of employees benefited from these provisions.

In terms of disability agreements, an initiative was taken with a view to extend measures to the European scope. "Youth-employment contracts" were implemented. These include an initiative which allows employees to prepare for their retirement, and in particular take early retirement.

Finally, an agreement was signed to designate employee representatives on the Board of Directors and an Employee Director was appointed on December 6, 2017.

Organization of legal working hours

In France, the general framework of legal working hours is defined in agreements signed with the unions.

A few activities operate with shift work. These concern fewer than 10 plants in the country, mainly in the Large Industries business line. A project is currently being deployed to reduce shift work.

On the other hand, the industrial activities, as well as those in Healthcare, include on-call systems that are regularly discussed and are subject to agreements with the unions.

Finally, in terms of telecommuting, the pilot program launched in France in 2013 in agreement with the unions has now been extended to several Group entities which represent 40% of employees in France. This approach is a response to employees' wishes in terms of work-life balance. The agreements signed with the unions demonstrate the wish of all parties to modernize collaboration practices.

3. Air Liquide and its shareholders: a long-term relationship

More than **62%**
of shareholders own their shares
for more than 10 years

Shareholders have been contributing to and supporting the Group's growth since its creation. During the 2016 acquisition of Airgas, they yet again confirmed their commitment to the Group's growth by participating massively in the capital increase in cash with preferential subscription rights. Today, it is thanks to their loyal support that Air Liquide can continue to change and grow. Air Liquide's long-term profitable growth strategy and its commitment to its shareholders are therefore closely linked.

At end-2017, the Group's 410,000 individual shareholders owned 32% of the capital, the highest percentage among companies in the CAC 40.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Individual shareholders	38%	38%	36%	37%	37%	36%	37%	36%	33%	32%
French institutional investors	26%	26%	23%	21%	19%	19%	17%	18%	20% ^(a)	19%
Non-French institutional investors	35%	36%	40%	42%	44%	45%	46%	46%	47% ^(a)	49%
Treasury shares	1%	> 0%	< 1%	> 0%	> 0%	> 0%	> 0%	> 0%	> 0%	> 0%
Registered capital	33%	32%	34%	35%	36%	35%	36%	36%	33%	34%
Capital eligible for the loyalty bonus	26%	25%	25%	28%	29%	30%	30%	30%	26%	25%

(a) In 2016, the proportion of institutional investors in the Group's capital increased due to their over-subscription to the capital increase.

3.1. A steady long-term performance and an attractive remuneration policy

Since its IPO in 1913, Air Liquide has always shown a profit and shared the fruits of its growth by rewarding its shareholders' confidence through a remuneration and loyalty policy that is based on regular dividend distribution, free share attribution and a loyalty bonus.

Over the last 20 years, Air Liquide's revenue has shown an average annual growth rate of +6.4%. This growth has been profitable: the Group's adjusted net earnings per share have followed a similar trend with an average annual growth rate of +7.7%. Over the same period, the dividend has seen an average annual growth rate of +9.5%.

During the last 10 years, more than 50% of earnings have been distributed to shareholders.

TSR, Total Shareholder Return, at December 31, 2017

Over 20 years, Total Shareholder Return (TSR) on invested capital is +10.5% for Air Liquide registered shares^(a), and +10.1% for Air Liquide bearer shares^(a), versus +6% for the CAC 40 index with reinvested dividends^(a). TSR is an annualized return rate for a shareholder who buys shares at the beginning of a period and sells them at the end of the period. This calculation takes into account the share price performance, dividends paid, including loyalty bonuses, considering that they are reinvested in shares, as well as free share attributions. Since 1962, the Group has carried out 30 free share attributions.

(a) Adjusted price based on the average annual number of shares (excluding treasury shares) to account for increases in capital via capitalization of reserves or additional paid-in capital, cash subscription and the two-for-one share split on June 13, 2007. Preferential Subscription Rights related to the capital increase carried out in September 2016 are accounted for as if they had been sold and then reinvested in shares.

3.2. Made-to-measure services

Shareholder Services, with approximately thirty employees, is a unique service at Air Liquide.

Air Liquide provides its institutional and individual shareholders, who are bearer or registered shareholders, with information and support. In addition to its steady performance and remuneration policy, and to increase the investment value of shares and reward long-term shareholders, Air Liquide showcases registered shares.

In 2017, as part of the NEOS company program, Shareholder Services launched its "Shareholder experience" approach to continue to improve the quality of its services for shareholders. As was the case with initiatives launched as part of the NEOS company program for a customer-centric strategy, Air Liquide has adopted a comprehensive active response to its shareholders and their expectations. The aim is to streamline administrative procedures by offering made-to-measure services, ensuring a better and wider circulation of strategy and financial information, for example with the live broadcasting of the Group

shareholders' events. The latest digital tools are also at the heart of this initiative as they are an excellent source of leverage and customization.

Registered shareholder services

This form of shareholding provides access to a loyalty bonus for registered shares held for more than two full calendar years: +10% on the amount of the dividends received and on the number of free shares granted during attribution transactions. To benefit from the loyalty bonus, shareholders must continue to hold their shares in registered form on the day of the dividend payment or of the free share attribution.

Air Liquide is the only CAC 40 company which manages internally all aspects of its shares on behalf of its 93,000 registered shareholders: account administration-holding, record keeping, centralization of the Shareholders' Meeting. They pay no handling fees, and broker fees are 0.18% excluding tax of the gross amount of the transaction, and reduced to 0.10% (excluding tax) for stock market orders placed online and paid by bank card or account debit.



Different shareholding options

Direct registered shares

Direct registered shares are managed by Air Liquide and recorded in its register. They are held in a securities account opened at Air Liquide.

Intermediary registered shares

Intermediary registered shares are registered in the Air Liquide account and held in a securities account or a personal equity plan at the shareholder's financial institution.

Bearer shares

Bearer shares are held in a securities account or a personal equity plan at a financial intermediary.

Innovation for the benefit of shareholders

Information documents and media for shareholders such as the Annual Report, the Shareholders' Guide, Shareholders' Newsletter "Interaction" and the Invitation to Shareholders' Meeting are drawn up with a particular focus on educating readers. Air Liquide also publishes, in the month after the event, a report of its Shareholders' Meeting that is sent to all shareholders who exercised their right to vote and presents all the discussions.

Direct registered shareholders have access to a personal secure space on the Internet, so that they can consult their share portfolio and documents useful for managing their account as well as modify their

personal information. They can also place buy and sell orders on the stock market online and view, in real time, the operations conducted on their share account.

Air Liquide was the first company to set up a Shareholders' Communication Committee (SCC). The SCC is composed of 12 shareholders and is regularly consulted on subjects relating to shareholder communication as well as plenary meetings with the Chairman and Chief Executive Officer. A Committee member is part of the Air Liquide Foundation's Project Selection Committee.

The Chairman and Chief Executive Officer is personally involved in Shareholders' Meetings, shareholders' conferences and Shareholders' Communication Committee.

3.3. Promoting dialog and meetings

Air Liquide regularly receives rewards for the quality of its financial communication and its transparency. In 2017, the Group received eight shareholder-related awards, including the Agefi's 1st prize for "Shareholding democracy, transparency of information and quality of communication", the "Prize for the Best General Shareholders' Meeting" decided by the readers of the French magazine *Investir*, Silver prize for

the best investor relations in the CAC40 awarded by French magazine *Le Revenu* and the "Investor Awards for education" voted by *Boursorama* and *Opinion Way*.

The Chairman and Chief Executive Officer is personally involved in Shareholders' Meetings, shareholders' conferences and Shareholders' Communication Committees.



Meeting with shareholders

The Shareholders' Meeting: the 2017 Shareholders' Meeting welcomed 4,000 people and 130,000 votes are counted each year. The dates for the next Air Liquide Combined Shareholders' Meeting are Wednesday May 16, 2018; Tuesday, May 7, 2019; and Tuesday May 5, 2020.

"Post-Shareholders' Meeting" conferences: the Chairman and Chief Executive Officer visits several town and cities in France to present the Group's results, strategy and outlook. For the first time this year, one of these regional meetings was broadcast in a live webcast on the Group website, allowing Internet users to ask questions directly online.

Conferences and trade shows: the Director of Shareholders Services and his teams regularly meet with shareholders. In 2017, more than 6,000 individual shareholders attended these meetings. Talks at business schools, universities and colleges are also organized, so that the decision-makers of the future have an early awareness of the culture of the stock market and of the major role of the shareholder in financing the economy.

The Shareholders' Meeting, the expression of shareholder democracy

Each year, all the Air Liquide shareholders who hold at least one share are invited to the Shareholders' Meeting. They receive all the documentation relating to their vote either by mail or by email more than one month

before the Shareholders' Meeting. In accordance with the principle of shareholder equality to which Air Liquide is very committed, each share entitles its owner to one vote. Air Liquide endeavors to make all this material available in English to its non-French shareholders in similar time frames. Air Liquide centralizes its Shareholders' Meeting by collecting the votes of its shareholders directly and offers voting by Internet.



Shareholder Services and Sustainable Development

Shareholders have had the option for many years of receiving their documents in digital form and voting by Internet. This measure saves some 5 tons of paper each year. Moreover, for all mailings, the Shareholder Services uses a film which is 99% biodegradable. As of January 1, 2018, regulations will gradually increase the use of a film that can be composted at home (50% in 2018, 70% in 2019, 100% in 2020). Shareholder Services decided to anticipate this obligation by using compostable film only for all documents in question as of January 1, 2018.

Dialog with the institutional investors

To demonstrate the solidity of Air Liquide's business model, the dynamism of its growth levers, and the soundness of its strategy, the Investor Relations Department meets more than 300 institutional investors each year during roadshows, conferences and individual meetings. Executive Management takes part in some of these meetings. Investor Days,

bringing together the financial community and Air Liquide's management are also exceptionally organized according to economic issues and current events.

In light of the financial community's increased interest in environmental and societal issues, the Sustainable Development Department takes part in these meetings, some of which are dedicated to this subject.

3.4. Recognizing and promoting the shareholder's key role

The accelerated decline in the number of individual shareholders in France is a major social challenge. Air Liquide is committed to defending individual shareholders' rights and promoting equity investments. The Group supports, in particular, stock market initiatives such as those

of the ANSA (Association Nationale des Sociétés par Actions), the Observatoire des Actionnaires d'Avenir and the F2iC (the French Federation of Investors and Investment Clubs).

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4. Listening to customers and patients

3.5 million customers and patients worldwide currently place their trust in Air Liquide. They all live in changing environments. Energy and environmental transition, changes in healthcare, as well as digital

transformation are giving rise to new usages and new challenges. Moreover, the industrial offer is gradually shifting towards a focus on the end user, transforming the traditional value chain.

4.1. The customer at the heart of Air Liquide's strategy

The Group is implementing a customer-centric transformation strategy which targets long-term profitable growth. It relies on operational excellence, the quality of its investments, open innovation, and a network-based organization. This transformation strategy is innovation based and leverages digital solutions.

The NEOS company program commits Air Liquide employees to offering an exceptional customer experience across all businesses. This approach is part of the continuous improvement process.

“Safety culture”: safety is Air Liquide's priority. This strong focus on safety relates to employees and subcontractors, industrial facilities, transport and the implementation of Group products and services at its customers' premises and in its patients' homes.

Reliability requirement: the Group pays particular attention to the quality of its products and compliance with current standards and regulatory requirements. It takes care to supply its customers on time and under all circumstances, thus guaranteeing the continuity of their operations.

Strengthening of our competitiveness: Air Liquide's differentiating strength is its in-depth understanding of its customers' needs and industrial procedures, and it provides them with targeted solutions which make it more competitive on its markets. Competitiveness is not just limited to cost and price, it also factors in quality, reliability and safety.

Solutions for the environment: drawing on its ability to innovate, the Group designs original solutions to serve industry and for cleaner transportation. It enables its customers to reduce their CO₂ emissions and improve their environmental footprint. More generally, Air Liquide helps its customers, in particular in developing economies, make the transition from “producing more” to “producing better”.

Easy interaction: Air Liquide is committed to making its customer experience smoother through easier interaction. Digital technologies play a key role in this aim, along with the attentiveness and commitment of the teams on the ground.



Air Liquide, a golden supplier

Since 2016, and for the second year in a row, Air Liquide was scored 67/100 by EcoVadis. This score puts the Group in the “Gold” category as an “advanced” supplier in terms of Sustainable Development (only 5% of suppliers fall within this category, which is the highest ranking). EcoVadis is the main global rating platform for the social and environmental performance of supply chains. The assessment covered the environment, social, business ethics and sustainable procurement.

Air Liquide also works with this platform to assess the sustainable development performance of its own suppliers.

4.2. Patient care

Our current society is faced with many public healthcare challenges including:

- an aging population: in the near future, almost a quarter of the population will be over 60 years old;
- the increase in chronic diseases, pandemics and nosocomial infections;
- urbanization and lifestyle changes;
- changes at hospitals and their role in light of these challenges.

With a long-term vision and as a benchmark healthcare player, Air Liquide provides solutions along the continuum of care in the following areas:

- home healthcare;
- hospital care;
- hygiene and healthcare specialty ingredients.

Home Healthcare

Air Liquide's Home Healthcare activity cares for more than 1.5 million patients worldwide in their homes suffering from chronic diseases. These treatments require medical respiratory equipment or nutritional assistance and treatment through perfusion to be made available in the patient's home. The human dimension is extremely important in this field as it involves raising awareness of the challenges of treatment and having patients and their families accept a treatment which can be long-term and constraining.

Air Liquide's employees provide home support to patients suffering from chronic pathologies such as respiratory insufficiency, sleep apnea, diabetes or Parkinson's disease. These multi-disciplinary teams of pharmacists, nurses, nutritionists and technicians are dedicated to providing services as cost-effectively as possible. Innovative training and support programs therefore aim to improve the patients' quality of life by helping reinforce treatment follow-up and increasing their autonomy.

The Home Healthcare activity sits at the heart of the healthcare system between the patient, hospital, doctors, nurses, health insurance organizations and pharmacists. Air Liquide supplies the products and medical equipment necessary to start treatment at the patient's home, following the medical prescription, and trains the patients and their families in the proper use of devices. Air Liquide, therefore, makes a major contribution to the care chain by ensuring patients' follow-up care at home. This activity demands high quality service on a daily basis and is focused on the long term, with all the caregivers dedicated to improving the patient's quality of life at home.

Hospital care

Air Liquide is one of the world leaders in medical gas production and distribution for hospitals and related services. The medical gases that Air Liquide provides, such as medical oxygen, are mainly used in emergency wards, operating theaters and intensive care units.

Air Liquide aims to help professionals to care for their patients while facing the constantly changing challenges in the healthcare environment, by supplying medical gases, related services and innovative solutions.

Air Liquide has developed a global solution bringing together gas, medical equipment, and services to provide care for pulmonary arterial hypertension. It also provides a medical gas for pain relief, used in some countries during childbirth and for procedures mainly carried out at dental surgeries. Air Liquide also offers services such as "Total Gas Management" (TGM) which remains permanently at the hospital in order to optimize the supply of medical gases and to monitor the different supply parameters so that the hospital can maintain efficiency. Air Liquide supports the transformation of hospital care and the development of outpatient care with a significant presence in the urban medical sector and care centers.

Hygiene and specialty ingredients

According to the World Health Organization (WHO), 5 to 10% of people hospitalized in advanced economies contract a nosocomial infection, and this proportion can exceed 25% in some developing economies^(a). This is a major public health issue, often caused by pathogenic multi-drug resistant bacteria. Prevention and hygiene help to reduce these risks. With its subsidiary Schülke, a specialist in hygiene and hospital disinfection, Air Liquide is developing an offer particularly dedicated to hospital hygiene, which will contribute to the fight against nosocomial infections and ensure the safety of patients and medical staff. The Group supplies disinfectants for hospitals, medical instruments and hand-cleansing for medical staff. It also supplies skin cleansers for pre-operative preparation for patients and antiseptics for wound-healing.

Air Liquide currently supplies more than 15,000 hospitals and clinics worldwide with these products and services.

As an Air Liquide Healthcare company, for over 70 years SEPPIC has created and supplied innovative specialty ingredients for the healthcare and beauty markets, in particular excipients and active ingredients for the cosmetics, pharmaceutical, and nutraceutical markets.

(a) WHO – Background to Clean Care is Safer Care. <http://www.who.int/gpsc/background/en/>

Partnership with patient associations

Since 2011, the Group's Healthcare World Business Line has worked in partnership with the EFA (European Federation of Allergy and Airways Diseases Patients' Associations). This Brussels-based European organization brings together the national associations of patients with respiratory ailments, with 22 countries represented. In the framework of this partnership, Air Liquide supports the actions on information and raising awareness initiated by the EFA in public opinion and the European authorities.

Through its partnership with the EFA, Air Liquide also contributed to a publication establishing care standards for patients with COPD^(a), incorporating the patients' point of view and distributing the publication to the European Commission and healthcare professionals. Air Liquide has also supported a study on patients with portable oxygen concentrators wishing to travel by air in Europe.

5. Sustainable procurement

The Group attaches great importance to the ability of its suppliers to offer long-term partnerships and to ensure a high level of safety, reliability, competitiveness and innovation, while guaranteeing that ethics and sustainable development are also taken into account. Air Liquide therefore strives to build long-lasting and balanced relationships with its suppliers, in an environment of mutual trust. The Group, for example, formalized this commitment in France by signing the Mediation Des Enterprises' Charter for responsible supplier relations.

The recognition of ethics and sustainable development-related challenges in our practices are set out in:

- the Procurement Code of Conduct, translated into 13 languages, which applies to all Group employees engaged in Procurement activities. It sets out the ethical and sustainable development principles that govern the Group's procurement;
- the Sustainable Procurement policy, updated in 2017, which lays out the guidelines to be applied by the procurement departments to integrate ethical, social and environmental aspects in their procurement processes, and defines the supplier risk prevention approach in terms of sustainable development.

Several measures have been implemented to raise awareness and train buyers in the context of the Group's Sustainable Procurement policy, thus strengthening its application within the organization:

- a Sustainable Procurement e-learning module has been developed. It is aimed at everyone in the Group that is involved in procurement and allows:



ALIGHT: an "enlightening" project

The ALIGHT project was awarded in the Sustainable Procurement category. This initiative consisted of replacing classic lighting with LED lighting at some twenty of Air Liquide's production and storage facilities and offices in the United Kingdom. This upgrade generated energy savings of around 70% and a reduction in CO₂ emissions of 300 tons per year. This project is the perfect example of measures which promote a reduction in our carbon footprint, an improvement in working conditions in terms of employee quality and safety, and the generation of economic efficiency. The Group had therefore decided to promote the rolling out of this project to all Air Liquide entities, under the close sponsorship of the Procurement, Sustainable Development and HSE Departments. Several tens of facilities across various geographic areas are currently testing the eligibility of this project in their territories. In the long term, several hundred facilities will be affected.

- the presentation of consistency between the Sustainable Procurement approach and the Group's strategy,
- the challenges of the Sustainable Procurement approach to be explained and positioned as a source of value creation for the Company,
- for the presentation of various tools to facilitate the roll-out of this approach.

To date, e-learning has been completed by 600 Air Liquide employees. Almost 70% of those who have completed this module consider that they have become more efficient in their role as buyers:

- specific training sessions covering the methodology for the sustainable development evaluation of suppliers and the implementation of corrective action plans were organized for the Group's buyers, in line with preceding years;
- since 2015, a Sustainable Procurement network of correspondents from the Group's main procurement organizations has been set up and is used as a local intermediary for the implementation of the Sustainable Procurement approach;
- since 2016, a Sustainable Procurement category has been introduced in our "Air Liquide Procurement Awards" to promote the best initiatives in this field and increase their visibility within the Group. Nine projects were submitted in this category in 2017.

(a) Chronic Obstructive Pulmonary Disease is chronic and progressive lung disease.

6. Public sphere relationships: a constructive and transparent policy

Air Liquide has formalized a Public Affairs policy governing the Group's interactions with the national, regional and international public spheres to develop growth opportunities, reduce risks relating to regulatory changes, and involving Air Liquide in public debate.

This policy specifies that Air Liquide work with the public authorities of each country in which it does business in a constructive and transparent manner, following ethical rules and applying political neutrality. All the Group's actions respect the official lobbying regulations in force in the countries in which it is present. Air Liquide is therefore listed in the "Transparency Register" of European institutions and in France in the "Interest Representatives" register which was created in 2017 and is managed by the High Authority of Transparency in Public Life (Haute Autorité pour la Transparence de la Vie Publique – HATVP).

Managers specialized in Public Affairs have been appointed in the principal countries, comprising a network of around 20 people worldwide, coordinated by the European and International Affairs Division. The tasks of these managers are to follow public initiatives that may have an impact on the Group and to interact with the public authorities to defend or promote Air Liquide's interests.

This network allows the Group to work on the definition of joint positions on cross-divisional challenges such as the circular economy, energy transition and innovation, and to share information on changes to social challenges in different parts of the world.



Air Liquide signatory of the French Business Climate Pledge

At the One Planet Summit launched by the French President on December 12, 2017, 91 French companies of all sizes and from all sectors signed the French Business Climate Pledge, a collective commitment in favor of the climate. More than 320 billion euros in funding, research and development and innovation will be pledged by these companies between 2016 and 2020 to transition to a low-carbon society.

For further information:

<http://www.medef.com/fr/communiqu-e-de-presse/article/one-planet-summit-89-entreprises-francaises-investissent-320-milliards-deuros-pour-le-climat>

Air Liquide's Public Affairs policy also aims to establish and develop constructive and sustainable relationships with:

- public authorities;
- professional bodies which represent the sectors in which the Group operates;
- other players such as non-governmental organizations and Think Tanks.

These interactions can take place either directly or through national or international associations of professional bodies such as the European Roundtable of Industrialists (ERT), currently chaired by Air Liquide's Chairman and CEO, Benoît Potier.

The Group also calls on outside consultants to support its actions. Public affairs cover all the Group's activities. The priorities in this area form part of a long-term process:

- the competitiveness of companies at worldwide level;
- air quality as a key public health challenge;
- energy transition and the environment with the boom in alternative energies (hydrogen energy, biogases, photovoltaic, wind turbines, etc.), their applications in particular in terms of mobility and energy efficiency;
- the carbon market with changes in European regulations and the development of regional markets in North America and Asia Pacific;
- the opportunities and risks relating to the digitalization of the economy;
- the defense of Air Liquide's shareholding model;
- at the European level, space exploration;
- the defense of intellectual property and the launch of the European unitary patent and of the Unified Patent Court;
- extra-financial reporting challenges.

In relation to fiscal matters, Air Liquide is particularly attentive to paying taxes in the countries where the Group is present and to the desire for good relations with the different local tax authorities.

H₂

Hydrogen Council

Launched during the Davos World Economic Forum at the beginning of 2017, the Hydrogen Council is the first global initiative of its kind which intends to show that hydrogen is a key solution in energy transition for transport. The group is currently composed of 28 multinationals, including Air Liquide. In November 2017, during COP 23, the Hydrogen Council presented the first quantified conclusions on the role of hydrogen on a global scale. This report, entitled *Hydrogen, Scaling up*, presents a deadline and complete roadmap on the deployment of hydrogen and the possibilities that this energy offers in terms of energy transition. If deployed on a large scale, hydrogen could represent one fifth of total energy consumed by 2050. This would help reduce annual CO₂ emissions by around 6 gigatonnes compared with current levels and account for 20% of the decrease required to limit global warming to 2°C. Moreover, hydrogen could generate revenue of 2,500 billion US dollars and create more than 30 million jobs by 2050.

EXTRA-FINANCIAL REPORTING AND METHODOLOGY

Unless stated otherwise, all data for 2017 includes data relating to Airgas, a company which was acquired in May 2016. Group data for 2016 however only includes Airgas when the indicator in question was available and its measurement in line with the Group's calculation criteria.

1. Safety indicators

SAFETY INDICATORS FOR THE GROUP AS A WHOLE

	2008	2009	2010	2011	2012	2013	2014	2015	2016 ^(f)	2017
Number of accidents involving lost time of at least one day of Group employees ^(a)	137	131	153	144	149	151	144	152	137	198
Accident frequency of Group employees ^(b)	1.8	1.7	1.9	1.7	1.7	1.6	1.6	1.6	1.4	1.6*
Accident severity rate ^(c)				< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Number of accidents of subcontractors and temporary workers ^{(d) (e)}	154	148	155	118	142	110	92	94	91	90
Frequency of accidents of subcontractors and temporary workers						2.2	2.3	2.2	2.0	2.1

(a) Fatal work accidents since 2011: none in 2017, one in 2016, none in 2015, none in 2014, three in 2013, one in 2012, one in 2011. Among these fatal accidents, the one in 2016 and one in 2013 were road accidents.

(b) Number of accidents involving lost time of at least one day, per million hours worked by Group employees. Accidents defined following the recommendation of the International Labour Office. Working hours are defined according to local employment laws.

(c) Average number of days of lost time per thousand hours worked. Accidents defined following the recommendation of the International Labour Office.

(d) Personnel working under an Air Liquide contract at a Group site, at a customer site, or as a delivery vehicle driver.

(e) Fatal work accidents since 2011: none in 2017, one road accident in 2016, one road accident in 2015, one road accident in 2014, three fatal work accidents in 2012 including a road accident, four fatal work accidents in 2011 including three road accidents.

(f) Excluding Airgas.

* Indicator verified by the independent verifier.

2. Environmental indicators

2.1. List of production units and their environmental footprint

The environmental elements that are most representative of the Group's activities and part of the Air Liquide Sustainable Development reporting are described below. They cover a total of 533 Air Liquide production units worldwide.

Type of production unit	Number of production units	Applications and environmental footprint
Large air separation units (ASU)	333	<p>Large air separation units produce oxygen, nitrogen and argon, with some sites also producing rare gases such as krypton and xenon.</p> <p>These factories "without chimneys" do not use any combustion processes. Since they discharge almost no CO₂, sulfur oxide (SO_x) or nitrogen oxide (NO_x), they are particularly environmentally friendly.</p> <p>They use almost exclusively electricity: worldwide they use about 3,700 MW at any given moment. The electricity purchased from our energy suppliers and consumed by the air separation units is the source of indirect emissions. The cooling systems of these units require back-up water.</p>
Hydrogen and carbon monoxide units (HyCO)	45	<p>Large hydrogen and carbon monoxide units also produce steam for some customers. They primarily use natural gas as raw material and some water, required for the reaction that produces hydrogen. Carbon monoxide is an essential raw material in the chemical industry for producing plastics. The desulfurization of hydrocarbons in order to produce fuels with reduced sulfur content is one of the main applications of hydrogen. These units emit CO₂ and nitrogen oxides (NO_x) but practically no sulfur oxide (SO_x). They also consume electricity and their cooling systems require back-up water.</p>
Cogeneration units	18	<p>Cogeneration units produce steam and electricity simultaneously. They consume natural gas and water, mostly converted into steam and supplied to customers. The steam can be condensed at these customers' facilities and then reused in the cogeneration unit. In most cases, the electricity produced is supplied to the local electricity distribution network, which in some countries can be used to power other units of the Group. Combustion of natural gas produces CO₂ and leads to low nitrogen oxide (NO_x) emissions, but practically no sulfur oxide (SO_x) emissions.</p>
Acetylene units	55	<p>These units produce acetylene, a gas primarily used in metal welding and cutting. 53 of these units produce this gas through the decomposition of a solid (calcium carbide) using water. Two units fill cylinders with this gas, which is supplied by another industrial company. This process produces lime, at least 90% of which tends to be recycled in industrial and agricultural applications.</p>
Nitrous oxide units	7	<p>Nitrous oxide is used primarily as an anesthetic gas in the healthcare sector and as a sweetening agent in the food industry. It is produced from ammonium nitrate in solid form or as a water-based solution.</p>
Carbon dioxide liquefaction and purification units	64	<p>These units liquefy and purify carbon dioxide, which has many industrial applications especially in the food industry where it is used to deep-freeze foods or to produce carbonated beverages.</p> <p>Carbon dioxide is most often a by-product of chemical units operated by other manufacturers. In some cases, it is found naturally in underground deposits, while in others it comes from the Group's hydrogen and carbon monoxide units. It is purified and liquefied in Air Liquide units consuming electricity and cooling water. In this unit, carbon dioxide is reused for other industrial applications instead of being emitted directly into the atmosphere.</p>
Units for the Hygiene and Specialty Ingredients activity	6	<p>These production units for the Hygiene and Specialty Ingredients activity are located in France, Germany and China and belong to the subsidiaries Schülke (Hygiene activity) and SEPPIC (Specialty Ingredients activity). Air Liquide experts work closely with hospitals to help them reduce the risk of nosocomial infection and contamination, thanks to the products the Group has developed. These units consume natural gas, electricity and water. Combustion of natural gas produces small amounts of CO₂.</p>
Engineering & Construction units	5	<p>Units for the Engineering & Construction activity taken into account in this reporting are located at five sites in France, China and the United Arab Emirates. They are mainly used for the construction of air separation columns and cryogenic tanks.</p>

2.2. Environmental footprint of road transportation

TRANSPORTATION: INDUSTRIAL MERCHANT ACTIVITY

	2013	2014	2015	2016	2017
Kilometers traveled by all vehicles delivering gas in liquid or cylinder form (in millions of km)	420	428	426	540	588*
Estimate of CO ₂ emissions generated by these vehicles in the Industrial Merchant activity (in thousands of tons)	462	471	468	600	653*
Evolution of the distance traveled per ton of liquid industrial gas delivered (oxygen, nitrogen, argon, carbon dioxide) ^(a) (truck delivery)	95.3	94.8	92.2	90.3 ^(b)	93.3*
Estimate of truck transport kilometers avoided through on-site customer units (in millions of km)	-72	-72	-74	-63 ^(b)	-57
Estimate of CO ₂ emissions avoided by these on-site units (in thousands of tons)	-72	-72	-74	-63 ^(b)	-58
Percentage of deliveries of air gases and hydrogen via pipeline or on-site	86%	86%	87%	85% ^(b)	85%

(a) In kilometers per ton delivered for the Industrial Merchant activity. 2008 base of 100.

(b) Excluding Airgas.

* Indicator verified by the independent verifier.

TRANSPORTATION: HEALTHCARE ACTIVITY

	2013	2014	2015	2016 ^(a)	2017
Transportation in the Home Healthcare activity					
Kilometers traveled (in millions of km)	161	149	161	173	184
Associated CO ₂ emissions (in thousands of tons)	38	35	39	38	35
Transportation in the Medical Gases activity					
Kilometers traveled (in millions of km)	26	26	28	27	33
Associated CO ₂ emissions (in thousands of tons)	23	23	25	24	29
TOTAL KILOMETERS TRAVELED HEALTHCARE BUSINESS LINE (in millions of km)	187	175	189	200	217
TOTAL ASSOCIATED CO₂ EMISSIONS (in thousands of tons)	61	58	64	62	64

(a) Excluding Airgas.

2.3. Summary of the Group's greenhouse gas emissions

The various Scopes

Companies' greenhouse gas emissions are usually broken down into three "scopes", depending on their origin.

- Scope 1 includes direct emissions generated by all possible emission sources owned or controlled by Air Liquide.

This scope includes:

- the Group's production units,
- the transport of products to customers or patients.

Nearly 94% of the direct emissions are related to the nature of the thermal energy used as a raw material by the Group's large hydrogen and carbon monoxide production units, and cogeneration units (for steam and electricity production). The vast majority of these units use natural gas^(a).

- Scope 2 corresponds to all indirect emissions related to the production of electricity or steam purchased outside the Group in the various countries where it operates. These emissions therefore have a close link with the carbon content of the electricity of countries where Air Liquide operates.

Scope 1 and 2 emissions represent 99% of the Group's total reported emissions in 2017.

- Scope 3 corresponds to other indirect emissions generated, for example, by Group employees' business travel or emissions linked to home-office commuting.

(a) Some hydrogen and carbon monoxide production unit also use other raw materials such as naphtha (a liquid similar to gasoline that comes from the distillation of oil) and various gases produced by refineries.

Group Scope 1 and Scope 2 emissions

	2013	2014	2015	2016 ^(a)	2017
Scope 1: total direct greenhouse gas emissions (GHG) (in thousands of tons of CO ₂ eq.) ^(b)	11,846	11,569	13,552	14,062	14,476*
Scope 2: total indirect GHG emissions (in thousands of tons of CO ₂) ^(c)	9,915	11,405	11,716	11,174	11,679*
TOTAL DIRECT AND INDIRECT EMISSIONS OF GHG (in thousands of tons of CO ₂ eq.)	21,761	22,974	25,268	25,236	26,155*

(a) Excluding Airgas.

(b) Includes CO₂ emissions and nitrous oxide emissions.

(c) Total of indirect GHG emissions generated by the production of electricity purchased outside the Group. The indirect emissions only concern CO₂ emissions. Calculation takes into account the primary energy source that each country uses to produce electricity (source: International Energy Agency).

* Indicator verified by the independent verifier.

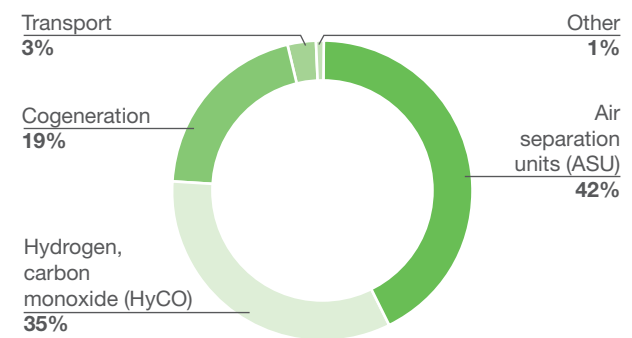
The Group's direct emissions increased from 14.1 million tons of CO₂ equivalent in 2016 to 14.5 million tons in 2017, i.e., an increase of 2.9%. This growth is mainly due to the first complete year of fully-stocked operation of the large hydrogen production unit in Yanbu (Saudi Arabia) and increased hydrogen production in Texas (USA). In both cases, the hydrogen produced is used to produce sulfur-free fuels and meet environmental standards.

The Group's indirect emissions increased from 11.2 million tons of CO₂ in 2016 to 11.7 million tons in 2017, i.e., an increase of 4.5%. This increase is directly due to the full-year integration of Airgas plants within the Group's scope.

Scope 3 emissions related to business travel

Business travel by plane, road or train is the source of reported Scope 3 CO₂ emissions.

These emissions represent less than 200,000 tons of CO₂ in 2017 for all subsidiaries, representing less than 1% of the Group's total reported emissions.

BREAKDOWN OF DIRECT AND INDIRECT GREENHOUSE GAS EMISSIONS BY UNITS**2.4. Energy efficiency of production units****ENERGY AND EFFICIENCY INDICATORS FOR THE GROUP AS A WHOLE**

	2013	2014	2015	2016 ^(a)	2017
Annual electricity consumption (in GWh) ^(b)	28,305	30,341	31,650	32,834	34,062*
Annual thermal energy consumption (in LHV terajoules) ^(c)	232,270	226,036	266,153	281,043	290,285* ^(d)
Evolution of energy consumption (per m ³ of air gas produced) ^{(e) (f)}	99.0	99.3	98.7	100.3	98.1*
Evolution of energy consumption (per m ³ of hydrogen produced) ^{(e) (g)}	97.9	97.5	99.3	99.5	98.6*

(a) Excluding Airgas.

(b) Includes a share of steam and compressed air purchased by the Group.

(c) LHV: Lower Heat Value, which includes the fact that energy from water vaporizing in fuel is not recovered.

(d) Approximately 80,000 GWh LHV.

(e) Calculated using a base of 100 in 2007.

(f) Gases produced (oxygen, nitrogen, argon) calculated in m³ of equivalent gaseous oxygen.

(g) Hydrogen and carbon monoxide.

* Indicator verified by the independent verifier.

The energy efficiency indicator of oxygen units improved by 2% in 2017. This was mainly due to optimization in the value chain resulting from the integration of Airgas plants, as well as the high activity level in France and Spain within the metals sector. Efficiency programs in China also continue to provide energy efficiency gains.

The energy efficiency indicator for hydrogen units also improved by 1% in 2017, principally as a result of the first complete year of fully-stocked operation of the Yanbu plant, in addition to efficiency gains related to large volumes produced in Northern Europe.

2.5. Discharges into air and water

DISCHARGES INTO AIR AND WATER (in tons)

	2013	2014	2015	2016 ^(a)	2017
Air discharge: NOx (nitrogen oxide)	4,400	3,200	3,270	3,563	3,542
Air discharge: SOx (sulfur oxide)	< 250	< 250	< 250	< 250	< 250
Volatile organic compounds (VOCs) discharged into the atmosphere (estimate)	110	110	99	76	146 ^(b)
Discharge to water: oxidizable matter	< 1,000	< 1,000	< 1,000	< 1,000	< 1,000
Discharge to water: suspended solids	< 1,500	< 1,500	< 1,500	< 1,500	< 1,500

(a) Excluding Airgas.

(b) This increase is mainly due to the acquisition of Serdex on January 1, 2017.

2.6. Waste and by-products

WASTE AND BY-PRODUCTS

	2013	2014	2015	2016 ^(e)	2017
Non-hazardous waste and by-products					
Annual quantity of lime produced (extracted dry equivalent) by the acetylene production units (in tons)	32,500	32,000	29,000	26,000	25,000
% recycled	> 80%	> 90%	> 80%	> 80%	> 90%
Metal waste (in tons) ^(a)	9,800	9,000	7,600	5,700	61,513 ^(b)
% recycled	> 99%	> 99%	> 99%	> 99%	> 99%
Total non-hazardous waste and by-products (estimate in tons)	42,300	41,000	36,600	31,700	86,513
Hazardous waste					
Paints and solvents (in tons)	150	100	104	106	79
% recycled	63%	63%	59%	63%	31% ^(c)
Oils (in tons)	800	600	650	696	821
% recycled	88%	83%	92%	91%	93% ^(d)
Total hazardous waste and by-products (estimate in tons)	950	700	754	802	899
TOTAL WASTE AND BY-PRODUCTS	43,250	41,700	37,354	32,502	87,412

(a) Non-hazardous metal waste.

(b) This figure includes cylinders as well as replacement of equipment in production sites. The sharp increase is explained by the nature of Airgas activity. For example, Air Liquide uses around 61,000 cylinders while Airgas uses 120,000.

(c) In addition, 58% is incinerated (35% in 2016).

(d) In addition, 7% is incinerated.

(e) Excluding Airgas.

Due to its industrial activity, the fight against food waste is not considered as a priority area for Air Liquide.

2.7. Regulations

CERTIFICATIONS (GLOBAL SCOPE - EXCLUDING AIRGAS)

	2013	2014	2015	2016	2017
Estimate of revenue of Group entities covered by an ISO9001 quality certification	72%	70%	72%	66%	73%
Estimate of revenue of Group entities covered by an ISO14001 environmental certification	27%	27%	27%	26%	30%
Estimate of revenue of Group entities covered by the OHSAS18001 occupational Health and Safety certification	15%	16%	15%	14%	16%

European REACH regulation

REACH (Registration, Evaluation, Authorization and restriction of CHemicals) is a European Union regulation that governs the registration, assessment and authorization of chemical substances produced in or imported to the European Union. Any chemical substance imported or manufactured in Europe of over one ton a year must be registered with the European chemicals agency ECHA. Each manufacturer or importer must have its own registration. This rule is part of the product stewardship approach developed by the chemicals industry.

The European REACH regulation went into effect on June 1, 2007 and registration and authorization procedures were spread over about 12 years for products already on the market.

Air Liquide's main products such as oxygen, nitrogen, hydrogen, CO₂, helium and rare gases are not subject to REACH registration.

Air Liquide is the lead registrant for several molecules, in particular specialty gases in the Electronics business (NF₃, CF₄, C₄F₈, SiF₄, etc.). Until now, several other products (carbon monoxide, acetylene, methanol^(a), lime^(b), nitrous oxide, ultra-pure fuels) have been registered in compliance with the schedule established by this regulation.

In addition, SEPPIC, which produces healthcare and beauty specialty ingredients, falls under the REACH regulation for some of its products. SEPPIC anticipated the introduction of the European REACH regulation and has complied with the various deadlines imposed by this regulation since it came into effect. As well as the European cases submitted under the REACH regulation, SEPPIC also complies with similar non-European regulations.

Air Liquide must also make sure that the raw materials in use are in compliance with the REACH regulation. In 2017, Group sales subject to REACH registration represent less than 3% of the Group's revenue.

(a) Methanol is the raw material used to produce hydrogen at one of the Group's units.

(b) Lime is a by-product of the Acetylene business.

Globally Harmonized System of Classification and Labelling of Chemicals

The Globally Harmonized System of Classification and Labelling of Chemicals, better known as GHS was created by the United Nations. This system sets out the classification of chemical products according to the type of danger that they represent and provides standardized hazard information, including labeling and safety data sheets.

This labeling must provide key information concerning health, safety and environmental protection to everyone who handles a hazardous product or who could be exposed to one.

In the countries in which GHS is applicable, Air Liquide subsidiaries have already implemented the principles of GHS in terms of product compliance with local and regional regulations.

Seveso 3 Directive

This European directive focuses on preventing major industrial risks. It applies to any facility where hazardous substances exceed certain quantities. These facilities are divided into two categories according to the quantity of such substances: Seveso 3 "upper tier" and "lower tier". In Europe, 102 "lower tier" and 24 "upper tier" Air Liquide sites are affected, mainly because of their stocks of oxygen.

Seveso regulations apply only in Europe but if the Seveso "upper tier" criteria were to be applied worldwide, 39 other Group sites would be covered.

CO₂ emission quotas

Air Liquide is present in a number of regions that have implemented, or are in the process of implementing, a quota system for greenhouse gas emissions. Air Liquide's Corporate teams and dedicated teams based in these regions monitor and assist these regulatory developments in order to ensure that their operations are fully compliant with the objectives and obligations related to these quota systems. Thanks to the energy efficiency of its production systems, Air Liquide is able to naturally minimize the energy footprint, and therefore the carbon footprint of its products and services.

In the European Union, the European directive ETS (Emission Trading Scheme) established a quota system for greenhouse gas emissions in 2005, in compliance with the Kyoto Protocol and EU targets on climate change. Following an initial phase from 2005 to 2007, and a second phase from 2008 to 2012, a third phase, covering the period from 2013 to 2020, has expanded the scope of industrial facilities subject to the ETS. For Air Liquide, seven cogeneration sites in Germany, France and the Netherlands, and all of the Group's large hydrogen product sites in Europe were affected by this directive in 2017. With regard to hydrogen production units, CO₂ emission quotas are mostly allocated for free,

according to a benchmark set for the top performing European facilities. Air Liquide obtains CO₂ quotas from the market or its customers in order to cover the emissions from hydrogen production sites not covered by the free allocations and for all emissions from the cogeneration sites.

A greenhouse gas emissions quota system was put in place in South Korea in 2015. It affects all of Air Liquide's air gas production and hydrogen and carbon monoxide units in Korea, with an allocation of free emission quotas based on historical emissions. This free emission quota volume will then be gradually reduced.

China announced ambitious targets for reducing the carbon intensity of its economy by 2030. In 2013 and 2014, the Chinese government launched pilot ETS programs in seven regions (the provinces of Guangdong and Hubei, and the cities of Beijing, Tianjin, Shanghai, Chongqing and Shenzhen). These programs, in which Air Liquide participates actively, relate to four Group production sites located in these regions (air gas and hydrogen units). At the end of 2017, the Chinese government implemented a national emissions trading scheme. China's national ETS only covers the electricity production sector for the moment. Other countries, including Kazakhstan and Singapore plan to implement their own ETS programs in 2018.

2.8. Environmental incidents and risks related to climate change

An Air Liquide procedure, available for all Group employees and fully integrated into Air Liquide's Industrial Management System (IMS), defines environmental incidents based on three levels of severity. All incidents reported at Group level are subject to a systematic, in-depth analysis, depending on the nature of the incident, so that preventative measures can be stepped up. Environmental risks related to industrial processes and risks related to climate change are taken into account by the Group and are presented in the "Risk factors" section of the Reference Document.

Most of the time, environmental incidents in the industrial and medical gases business have a very low impact on the environment compared to the traditional chemicals industry. For example, in air gas production, any possible leak of these gases does not represent any danger for

the atmosphere. Likewise, the water used in Air Liquide's processes is primarily used in cooling and steam production. The risk of possible pollution of the water used is therefore very low. In 2017, there were a total of 14 environmental incidents in the Group, mainly involving air gas and oil leaks.

Climate risks are reviewed at both Group and site level. Weather-related and climatic disasters, water stress and the increased frequency of cyclones constitute a risk that could disrupt the smooth running of operations. Preventive measures targeting extreme weather-related phenomena exist at the main sites located in high-risk areas.

The amount of financial provision and guarantees earmarked for environmental risks is 11,8 million euros.

3. Specific indicators for the Home Healthcare activity linked to the issue of socially responsible bonds

In 2012, Air Liquide issued its first SRI-labeled bond^(a) under its Euro Medium Term Notes (EMTN) program, for a total amount of 500 million euros. This bond was mostly placed with investors having SRI management mandates and permitted the Group to diversify its financing sources. After numerous public authorities and supranational issuers, Air Liquide became the first company in the world to issue bonds meeting the criteria of SRI investors. Obtaining a rating from the extra-financial rating agency Vigeo for the Home Healthcare activity led to this issue being given an SRI label. This evaluation is based on the social, environmental and governance criteria of the Home Healthcare activity that concerns more than 1.5 million patients worldwide.

In the framework of this SRI bond issue, Air Liquide made a commitment to publishing during the life of these bonds, i.e. nine years, indicators specific to the Home Healthcare activity in the area of the environment, safety and employee diversity.

Number of patients treated	2013	2014	2015	2016	2017
Total number of patients treated by the Air Liquide Home Healthcare Division	1,100,000	1,200,000	1,300,000	1,400,000	1,550,000
Group employees					
Home Healthcare activity employees ^(a)	7,748	8,183	9,112	9,492	10,015
Safety					
Number of lost-time accidents of at least one day among employees ^(b)	77 ^(b)	62 ^(b)	79 ^(b)	63 ^(b)	66 ^(b)
Number of accidents of subcontractors and temporary workers ^(c)	13 ^(b)	9 ^(b)	16 ^(b)	21 ^(d)	8 ^(b)
Equality					
% of women among managers and professionals	56%	58%	58%	57%	58%
% of women among managers and professionals hired during the year	70%	56%	58%	62%	59%
Training					
Average number of days of training per employee, per year	2	2	1.6	2.1	1.9 ^(e)
Kilometers driven and CO₂ emissions related to transportation					
Kilometers driven per patient monitored per year	147	124	123	131	118
CO ₂ emissions related to transportation per patient (kgCO ₂ /patient) per year	35	29	30	29	23

(a) Employees under contract, excluding temporary employees.

(b) No fatal work accidents.

(c) Personnel working under an Air Liquide contract at a Group site, at a customer site, or as a delivery vehicle driver.

(d) One fatal accident (road accident).

(e) 14 hours a year according to counting in hours (base: 1 day = 7.5 hrs).

(a) Socially Responsible Investment: application of sustainable development principles to investment. Approach consisting in systematically considering the three dimensions – environment, social/societal, governance – in addition to the usual financial criteria.

4. Human Resources indicators

GROUP EMPLOYEES ^(a)

Headcount ^(a)	2013	2014	2015	2016	2017
Group employees	50,250	50,300	51,500	66,700	65,200*
Women ^(e)	13,500	13,600	14,200	17,000	16,900
as a %	27%	27%	28%	25%	26%
Men ^(e)	36,750	36,700	37,300	49,700	48,300
as a %	73%	73%	72%	75%	74%
Joining the Group ^(b)	14.9%	14.8%	16.5%	17.1%	16.7%
Leaving the Group ^(c)	13.1%	14.7%	14.0%	15.1%	18%
% of employees having resigned during the year ^(d)	4.9%	5.8%	5.3%	5.4%	7.5%

(a) Employees under contract, excluding temporary employees.

(b) Hiring or integration due to acquisitions. The percentage is based on the number of employees as of December 31 of the preceding year.

(c) Retirement, resignations, layoffs (around 20% of the departures), departures due to disposals, etc. The percentage is calculated based on the number of employees as of December 31 of the preceding year.

(d) Calculated on the number of employees as of December 31 of the preceding year.

(e) Estimate.

* Indicator verified by the independent verifier.

HUMAN RESOURCES INDICATORS IN THE GROUP

	2013	2014	2015	2016 ^(a)	2017
Parity and diversity					
Equality					
% of women among managers and professionals	27%	28%	29%	30%	29%*
% of women among managers and professionals hired during the year	36%	31%	34%	39%	37%*
% of women among employees considered as high potential	40%	41%	38%	40%	40%
Number of nationalities					
Among expatriates	45	44	50	44	53
Among Senior Managers	28	31	33	30	33
Among employees considered as high potential	46	44	48	49	52
Number of nationalities among senior managers/ Number of countries where the Group is present	35%	39%	41%	38%	41%
Training^(b)					
% of total payroll allocated to training	About 2%	About 2%	About 2%	About 2%	About 2%
Average number of days of training per employee, per year (order of magnitude)	3.5 days	3.5 days	3.5 days	3.1 days	3.0 days ^(c)
% of employees who attended a training program at least once during the year (order of magnitude)	75%	78%	77%	72%	73%*
Performance review					
% of employees who have had a performance review meeting with their direct supervisor during the year	78%	79%	80%	76%	81%*
% of employees who have had a career development meeting with the HR Department during the year	14%	16%	15%	17%	12% ^(d)
Remuneration					
% of employees with an individual variable share as part of their remuneration	56%	58%	60%	63%	57%
Absenteeism					
Absence rate of Air Liquide employees (estimate)	3.6% ^(e)	2.4% ^(f)	2.7% ^(f)	2.7% ^(f)	2.5% ^(f)
Ethics					
% of employees belonging to a unit with a local Code of Conduct	94%	94%	97%	96%	97%
Employee loyalty					
Average seniority in the Group	10 years	10 years	10 years	10 years	10 years
Retention rate of managers and professionals over a year ^(g)	94.8%	93%	95%	95%	93%
Social performance					
% of employees with disabilities ^(h)	1.4%	1.3%	1.4%	1.4%	1.1% ⁽ⁱ⁾
% of employees having access to a representation/dialog/consultation structure	76%	76%	79%	82%	85%
% of employees belonging to an entity at which an internal commitment survey was conducted within the last three years	> 50%	> 55%	68%	65%	45% ^(j)
Employee shareholders					
% of capital held by Group employees ^(k)	1.6%	1.5%	1.5%	1.5%	1.5%
% of Group employees that are shareholders of L'Air Liquide S.A.	More than 55%	More than 50%	Almost 50%	More than 50%	36%

(a) Excluding Airgas.

(b) Excluding Airgas. This indicator covers 72% of the consolidated scope. For more information, see page 94.

(c) 23 hours a year according to counting in hours (base: 1 day = 7.5 hrs).

(d) 17% excluding Airgas.

(e) Calculated for Europe.

(f) Calculated Worldwide.

(g) This rate takes only resignations into account.

(h) For the countries where regulations allow this data to be made available.

(i) 1.5% excluding Airgas.

(j) 63% excluding Airgas.

(k) Within the meaning of article L. 225-102 of the French Commercial Code (Code de commerce).

* Indicator verified by the independent verifier.

5. Reporting Methodology

5.1. Protocol and definitions

In the absence of a relevant and recognized protocol for industrial gas operations, Air Liquide has created its own protocol to define its reporting methods for Human Resources, safety and environmental indicators. This protocol includes all the definitions, measurement procedures and collection methods for this information. In line with the Group's commitment to continuous improvement, Air Liquide is progressively completing the work of adjusting to its sustainable development indicators protocol to reflect changes in the Group.

This protocol is based on the general principles defined by the Group with regard to scope, responsibilities, controls and limits, and establishes definitions, the departmental responsibilities, tools and data-tracing methods for each indicator. This document is regularly updated. Moreover, this protocol takes into account all the Group's formalized procedures in the framework of the IMS (Industrial Management System) and the global protocol for Group Policies, Codes and Procedures called the BLUEBOOK.

5.2. Scope and consolidation methods

Human Resources and environmental indicators are consolidated worldwide for all companies integrated within the financial consolidation scope. Entities accounted for by the equity method.

Safety indicators are consolidated worldwide for all companies in which Air Liquide has operational control or is responsible for safety management.

Apart from these general rules, there are certain specific ones:

- information on the impact of transportation (kilometers traveled by delivery trucks, CO₂ emitted) is calculated on the basis of data collected in the main countries where the Group is established around the world;
- information on kilometers saved and CO₂ emissions avoided through on-site air gas production units and efficiency measures pertains to fully consolidated subsidiaries;

- environmental and energy indicators for the main types of production units operated by the Group cover about 99% of the Group's Gas & Services revenue, and 98% of the Group's total revenue;
- for environmental and energy indicators, production units are included in the reporting system from the effective date of their industrial commissioning;
- electricity consumption, and the indirect CO₂ emissions related to it, are only taken into account when Air Liquide pays for this electricity. Energy consumption of on-site units, as well as water consumption specific to the sale of treated water (which is not part of the Group's core business) are excluded from the consolidation scope of the data. When the Group has cogeneration units in a country where ASUs are available, the indirect emissions from the electricity of these units are not taken into account;
- the segmentation between advanced economies and developing economies used for direct and indirect greenhouse gas emissions is the same as that used by the Finance Division.

5.3. Reporting and responsibilities

The Human Resources, safety and environmental indicators are produced by several data-collection systems in the Group, each under the responsibility of a specific department:

- Human Resources indicators included in the Group's general accounting consolidation tool fall under the responsibility of the Human Resources Department;
- the energy consumption and CO₂ emissions indicators for the main air separation units, and cogeneration, hydrogen and carbon monoxide units are tracked by the Large Industries business line using a dedicated Intranet tool;

- as a complement, environmental and safety reporting is carried out by the Safety and Industrial Management System Department using a dedicated Intranet tool, and includes:
 - for all units, the data of the Group's accident reporting,
 - for the units of the Large Industries business line, other environmental indicators (atmospheric emissions, water consumption, discharge to water, etc.),
 - for the smaller units (acetylene, nitrous oxide, carbon dioxide units and Hygiene and Specialty Ingredients activities), the Engineering & Construction business units, the Research & Development sites and the Technical Centers, all indicators (energy use, atmospheric emissions, water consumption, discharge to water, etc.);

- indicators on Industrial Merchant transportation are the responsibility of this business line;
- indicators on the transportation of Medical Gases and Home Healthcare are the responsibility of the Healthcare business line;
- the estimate of the percentage of the Group's revenue with respect to the implementation of the Industrial Management System (IMS), as well as ISO 9001, ISO 14001 and OHSAS 18001 are indicators under the responsibility of the Safety and Industrial System Department;
- among the subjects covered by the French "Grenelle 2" law, soil pollution and the consideration of noise pollution are not relevant for the Industrial Gas business, given the size of the Group's sites and the noise levels generated. They are therefore not mentioned in this report.

5.4. Methodology used for the mapping of Sustainable Development stakes

To draw up this map or materiality matrix, Air Liquide brought together a working group composed of various Group departments. The main stakeholders were consulted to assess the importance of these stakes to each of them: customers, patient associations, suppliers, investors, journalists, NGOs, panels of employee representatives and of individual shareholders.

This consultation was supplemented by the data analysis of non-financial rating agencies and the conclusions of a quantitative survey of the

French general public which was carried out on this subject in 2015. The results were then consolidated by assigning an equal weighting to the statements of each stakeholder.

The horizontal X-axis positions these stakes according to their importance to the Company and on the Y-axis they are positioned according to their importance to the stakeholders.

5.5. Controls

Each department in charge of collecting data is responsible for the indicators provided. Control occurs at the time of consolidation (review of changes, inter-entity comparisons).

Safety and energy indicators are tracked monthly. In addition, audits of environmental data are carried out by the Safety and Industrial System Department on a sample of sites representative of the various types of units monitored. Where the data reported are inconsistent or missing, an estimated value may be used by default.

5.6. Methodological limits

The methodologies used for certain Human Resources, safety and environmental indicators can have certain limits due to:

- the absence of nationally or internationally recognized definitions, in particular for indicators on managers and professionals and social performance indicators;
- the representativeness of the measurements taken and required estimates. This is particularly the case for indicators regarding CO₂ emissions avoided, water consumption, kilometers avoided per on-site unit, and training.

➤ INDEPENDENT VERIFIER'S REPORT

Independent verifier's report on consolidated social, environmental and societal information presented in the management report

This is a free translation into English of the original report issued in the French language and it is provided solely for the convenience of English-speaking users. This report should be read in conjunction with, and construed in accordance with French law and professional standards applicable in France.

To the shareholders,

In our quality as an independent verifier accredited by the COFRAC^(a), under the number n° 3-1050, and as a member of the network of one of the statutory auditors of the company L'Air Liquide, we present our report on the consolidated social, environmental and societal information established for the year ended on the December 31, 2017, presented in chapter "Corporate Social Responsibility and Sustainable Development Report" of the management report, hereafter referred to as the "CSR Information," pursuant to the provisions of the article L.225-102-1 of the French Commercial Code (Code de commerce).

RESPONSIBILITY OF THE COMPANY

It is the responsibility of the Board of Directors to establish a management report including CSR Information referred to in the article R. 225-105 of the French Commercial Code (Code de commerce), in accordance with the protocols used by the company (hereafter referred to as the "Criteria"), mainly composed of BLUEBOOK protocols, supported by the procedures defined in the Industrial Management System which were applicable in 2017, and of which a summary is included in the chapter "Reporting Methodology" of the management report and available on request.

INDEPENDENCE AND QUALITY CONTROL

Our independence is defined by regulatory requirements, the Code of Ethics of our profession as well as the provisions of article L. 822-11 of the French Commercial Code (Code de commerce). In addition, we have implemented a quality control system, including documented policies and procedures to ensure compliance with ethical standards, professional standards and applicable laws and regulations.

RESPONSIBILITY OF INDEPENDENT VERIFIER

It is our role, based on our work:

- to attest whether the required CSR Information is present in the management report or, in the case of its omission, that an appropriate explanation has been provided, in accordance with the third paragraph of R. 225-105 of the French Commercial Code (Code de commerce) (Attestation of presence of CSR Information);
- to express a limited assurance conclusion, that the CSR Information, overall, is fairly presented, in all material aspects, in according with the Criteria;

Nonetheless, it is not our role to give an opinion on the compliance with other legal dispositions where applicable, in particular those provided for in the article L. 225-102-4 of the French Commercial Code (vigilance plan) and in the Sapin II law n°2016-1691 of 9 December 2016 (anti-corruption).

Our verification work mobilized the skills of nine people between August 2017 and February 2018 for an estimated duration of fifteen weeks.

We conducted the work described below in accordance with the professional standards applicable in France and the Order of 13 May 2013 determining the conditions under which an independent third-party verifier conducts its mission, and in relation to the opinion of fairness and the reasonable assurance report, in accordance with the international standard ISAE 3000^(b).

(a) Scope available at www.cofrac.fr

(b) ISAE 3000 – Assurance engagements other than audits or reviews of historical information.

1. Attestation of presence of CSR Information

NATURE AND SCOPE OF THE WORK

We obtained an understanding of the company's CSR issues, based on interviews with the management of relevant departments, a presentation of the company's strategy on sustainable development based on the social and environmental consequences linked to the activities of the company and its societal commitments, as well as, where appropriate, resulting actions or programs.

We have compared the information presented in the management report with the list as provided for in the article R. 225-105-1 of the French Commercial Code (Code de commerce).

In the absence of certain consolidated information, we have verified that the explanations were provided in accordance with the provisions in article R. 225-105-1, paragraph 3, of the French Commercial Code (Code de commerce).

We verified that the information covers the consolidated perimeter, namely the entity and its subsidiaries, as aligned with the meaning of the article L. 233-1 and the entities which it controls, as aligned with the meaning of the article L. 233-3 of the French Commercial Code (Code de commerce).

CONCLUSION

Based on this work, we confirm the presence in the management report of the required CSR information.

2. Limited assurance on CSR Information

NATURE AND SCOPE OF THE WORK

We undertook that ten interviews with people responsible for the preparation of the CSR Information in the departments in charge of the data collection process and, if applicable, the people responsible for internal control processes and risk management, in order to:

- Assess the suitability of the Criteria for reporting, in relation to their relevance, completeness, reliability, neutrality, and understandability, taking into consideration, if relevant, industry standards;
- Verify the implementation of the process for the collection, compilation, processing and control for completeness and consistency of the CSR Information and identify the procedures for internal control and risk management related to the preparation of the CSR Information.

We determined the nature and extent of our tests and inspections based on the nature and importance of the CSR Information, in relation to the characteristics of the Company, its social and environmental issues, its strategy in relation to sustainable development and industry best practices.

For the CSR Information which we considered the most important ^(a):

- At the level of the consolidated entity and business lines, we consulted documentary sources and conducted interviews to corroborate the qualitative information (organization, policies, actions, etc.), we implemented analytical procedures on the quantitative information and verified, on a test basis, the calculations and the compilation of the information, and also verified their coherence and consistency with the other information presented in the management report;
- At the level of the representative selection of entities and sites that we selected ^(b), based on their activity, their contribution to the consolidated indicators, their location and a risk analysis, we undertook interviews to verify the correct application of the procedures and undertook detailed tests on the basis of samples, consisting in verifying the calculations made and linking them with supporting documentation. The sample selected therefore represented on average 24% of the energy consumption (thermal and electric), and 13% of Group employees, that were considered as representative characteristics of the environmental and social domains.

For the other consolidated CSR information, we assessed their consistency in relation to our knowledge of the company.

Finally, we assessed the relevance of the explanations provided, if appropriate, in the partial or total absence of certain information taking into account, if relevant, professional good practices.

We consider that the sample methods and sizes of the samples that we considered by exercising our professional judgment allow us to express a limited assurance conclusion; an assurance of a higher level would have required more extensive verification work. Due to the necessary use of sampling techniques and other limitations inherent in the functioning of any information and internal control system, the risk of non-detection of a significant anomaly in the CSR Information cannot be entirely eliminated.

CONCLUSION

Based on our work, we have not identified any significant misstatement that causes us to believe that the CSR Information, taken together, has not been fairly presented, in compliance with the Criteria.

Paris-La Défense, February 23, 2018

French original signed by:

The independent verifier

ERNST & YOUNG et Associés

Sustainable Development – Partner
Éric Duvaud

Partner
Bruno Perrin

(a) Social informations :

- Indicators (quantitative information) : Headcount (Nb), recruitments and departures (% headcount), rate of women within the managers and professionals population (present and hired %), rate of employees having attended at least a training session during the year (%), rate of performance appraisals performed by managers during the year (%), accident frequency rate of the group employees.
- Qualitative information: health and safety at the work place for the group employees and its subcontractors, employee engagement, retention of employees, and responsible purchasing.

Environmental and Societal information :

- Indicators (quantitative information) : Annual electricity (GWh) and thermal energy consumption (TJ PCI), evolution of energy consumption per m³ of air gas produced and per m³ of hydrogen produced (base 100 in 2007), evolution of the distance traveled per ton of industrial gas delivered as liquid (oxygen, nitrogen, carbon monoxide, base 100 in 2007), direct & indirect greenhouse gas (GHG) emissions (scopes 1&2, in MtCO₂), estimation of the annual water consumption (Mm³).
- Qualitative information: General environmental policy (management of the industrial system and certification), sustainable use of resources (energy consumption, measures undertaken to improve energy efficiency), climate change (significant sources of greenhouse gases generated as a result of the company's activities).

(b) Environmental Indicators: Air separation units of Cherepovets 11 & 12 (Russia), air separation units of Jurong 8 & 9 and Air Liquide Singapore Pipeline (Singapore), air separation units of Düsseldorf (Duisburg – Ruhr Network) (Germany), hydrogen unit of Jurong 10 (Singapore), hydrogen unit of Dormagen (Germany), cogeneration unit of Dresden (Germany), conditioning sites of industrial merchant of Germany. Follow up audits of the air separation units of Bayport 3 & 4 (USA), hydrogen unit of Bayport (USA), hydrogen units of Yanbu 1 & 2 (Saudi Arabia) and cogeneration unit of Bayport (USA).

Safety and Social Indicators: On-site audits of Gasmedi (Spain and Portugal), Vitalaire (Germany), Schülke & Mayr (Germany), AL German Industry (Germany), AL France Industrie (France). Follow-up audits of Al Khafrah Industrial Gases (Saudi Arabia) and AL Advanced Materials (USA).

> APPENDIX

Link between Air Liquide's Sustainable Development indicators and the indicators of the Global Reporting Initiative (GRI)

Page	Indicateurs Air Liquide	Indicateur GRI
Human Resources		
117	Group employees	G4-LA1
95	Distribution of employees by geographic area	G4-LA1
97	Distribution of employees by age bracket	G4-LA1
117	Turnover of employees (leaving the Group)	G4-LA1
118	Retention rate of managers and professionals	G4-LA1
117	% of women in the Group	G4-LA12
118	% of women among managers and professionals	G4-LA12
118	Average number of days of training per employee, per year	G4-LA9
118	% of employees who have had a performance review meeting with their direct supervisor during the year	G4-LA11
118	Diversity indicator (number of nationalities)	G4-LA12
Safety		
109	Number of lost-time accidents of Group employees	G4-LA6
109	Accident frequency of Group employees	G4-LA6
109	Number of lost-time accidents of subcontractors and temporary workers	G4-LA6
Energy and environment		
112	Total annual electricity consumption	G4-EN3
112	Total annual thermal energy consumption	G4-EN3
112	Evolution of energy consumption per m ³ of air gas produced (ASU)	G4-EN5
112	Evolution of energy consumption per m ³ of hydrogen produced (HyCO)	G4-EN5
111	Evolution of the distance traveled per ton of gas delivered	G4-EN30
85	Total annual water consumption	G4-EN8/EN22
112	Total direct greenhouse gas emissions	G4-EN15
112	Total indirect greenhouse gas emissions	G4-EN16
113	Emissions into the atmosphere (NO _x , SO _x)	G4-EN21
82;85	GHG emissions avoided in Air Liquide operations and at customers' facilities	G4-EN19
113	Estimate of emissions into the atmosphere (VOCs)	G4-EN21
113	Discharge to water (oxidizable matter, suspended solids)	G4-EN22
113	Total mass of waste by type and waste treatment	G4-EN23
Transportation		
111	Estimate of CO ₂ emissions generated by truck delivery	G4-EN30
111	Estimate of CO ₂ emissions avoided through on-site units	G4-EN19



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